REVISIONARY STUDIES ON BLATTELLIDAE (BLATTARIA) FROM THE INDO-AUSTRALIAN REGION

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The genus *Shelfordina* Hebard is reviewed and the following 10 species are redescribed: *digitata* (Hanitsch); *fuscocastanea* (Hanitsch); *jarakae* Hebard; *latimarginata* (Hanitsch), n. comb.; *minor* (Hanitsch); *orchidae* (Asahina), n. comb.; *panamae* (Hebard), n. comb.; *spinistylifera* (Roth), n. comb.; *terminalis* (Brunner); *uniformis* (Hanitsch). The following 7 new species of *Shelfordina* are described: *cooki*; *philippinensis*; *robertsi*; *sumatrensis*; *tozerensis*; *wailimensis*; *yeatesi*. Five species are found in Australia, one is from Panama and the others are mostly Indonesian. The type species of the related genus *Imblattella* Bruijning, *Imblattella impar* (Hebard), is redescribed. The Australian genus *Dyakinodes* Princis is reviewed. One species, *centralis* (Walker) is redescribed and the following 6 new taxa are described: *bispinulifera*; *fraserensis*; *kurandensis*; *penibifida*; *waterhousei*; *uptoni*. Keys for identifying males of *Shelfordina* and *Dyakinodes* are given. Three species of *Anaplecta* Burmeister are recognised in Australia, namely, *A. calosoma* Shelford from Queensland (previously known from Papua New Guinea), *A. australiensis* n.sp. from Queensland and Northern Territory, and *A. brachyptera* n.sp. from Queensland. The banded tegmina of *calosoma* are similar to those of *A. vittata* Hanitsch (Singapore, Sumatra, West Malaysia, and Indonesia), but based on male genitalia both taxa are distinct.
Parectoneura bivittata n.gen., n.sp. from Northern Territory and Western Australia is described. *Pseudectoneura* Princis (New Caledonia) and *Pseudectobia* Saussure (India) are redescribed. *Pseudectobia insularis* (Saussure) (Mauritius) is transferred to *Chorisoblatta* Saussure and Zehntner. The subfamily placement of the last four genera is discussed. *Parectoneura* and *Pseudectoneura* are placed in the Blattellinae and *Pseudectobia* and *Chorisoblatta* are assigned to the Pseudophyllodromiinae. ☐*Insecta, Blattaria, Blattellidae, taxonomic revisions, Indo-Australian.*

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In this paper I review several blattellid genera, one of which, *Dyakinodes* with 7 species, occurs only in Australia. The Second, *Shelfordina*, has 17 species, 5 of which occur in Australia and the others are mainly Indonesian. In 1986 Dr David Rentz of CSIRO sent me some cockroaches that were found feeding on orchids in a greenhouse in Canberra. I decided the species was *Imblattella panamae* Hebard (*in* Rentz, 1987a) basing my determination on Asahina's (1973) description of what he believed to be that species found on orchids in a Tokyo greenhouse. I was unaware that Asahina (1985) decided that the Tokyo species was not *panamae* and described it as *Imblattella orchidae*. After examining a paratype of *I. panamae* I concluded that it belonged in the genus *Shelfordina* Hebard, as did *orchidae*.

One of the diagnostic characters of *Shelfordina* is the presence of a stylelike structure near the base of each style so that the male seems to have 4 styles rather than 2. I have examined the type species of *Imblattella* [*I. impar* (Hebard)] and find that it is not congeneric with *Shelfordina*. Other species now in *Imblattella* should be reexamined, as should those species that appear to have 4 styles. Some species of *Margattea* Shelford [e.g., *contingens* (Walker), and *longealata* (Brunner)] have accessory styles similar to those in *Shelfordina*, but they have Type B front femurs (Roth, 1989), rather than Type A.

In this paper I also describe 2 new species of *Anaplecta*, and redescribe *Anaplecta calosoma*, all from Australia, the latter also occurring in Papua New Guinea. I also describe *Parectoneura bivittata* n.gen., n.sp., from Northern Territory and Western Australia. Superficially this species resembles some species of *Ectoneura*, an Australian genus which Hebard (1943) placed in the Ectobiinae, and Princis (1969) included in the Chorisoneuridae. I redescribe *Pseudectoneura*

Princis, and *Pseudectobia* Saussure because the diagnosis of the former was similar to that of *Parectoneura*, and the latter name suggested a relationship to *Ectobius*.

The specimens used in this study were loaned to me by the following museums and their curators or collection managers: AMSA - Australian Museum, Sydney, New South Wales; Dr M.R. Gray and Mr B.J. Day; ANIC - Australian National Insect Collection, CSIRO, Canberra, Australian Capital Territory, Australia, Dr D.C.F. Rentz and Mr John Balderson; ANSP - Academy of Natural Sciences of Philadelphia, PA, U.S.A., Mr Donald Azuma; BMNH - British Museum (Natural History), London, England, Mrs Judith Marshall; BPBM - Bernice P. Bishop Museum, Honolulu, Hawaii, U.S.A., Mr Gordon Azuma and Mr J. Strazanac; DARA - Biological and Chemical Research Institute, Rydalmere, New South Wales, Australia, Dr G.R. Brown; HDEO - Hope Entomololgical Collections, University Museum, Oxford University, Oxford, England, Dr G.C. McGavin; ISNB - Institut Royal des Sciences Naturelle de Belgique, Brussels, Belgium, Dr P. Grootaert; MCZH - Museum of Comparative Zoology, Harvard University, Cambridge, MA, U.S.A.; MHNB - Naturhistorisches Museum, Basel, Switzerland, Dr M. Brancucci; MNHG - Museum d'Histoire Naturelle, Geneva, Switzerland, Dr Bernd Hauser; NMVM - National Museum of Victoria, Melbourne, Victoria, Australia, Dr A. Neboiss; NMWA - Naturhistorisches Museum Wien, Vienna, Austria, Dr U. Aspöck; QMBA - Queensland Museum, Brisbane, Queensland, Australia, Dr G.B. Monteith; SAMA - South Australian Museum, Adelaide, South Australia, Dr G.F. Gross; UZMC - Universitets Zoologiske Museum, Copenhagen, Denmark, Dr H. Enghoff. [The United States National Museum, Washington, D.C. (USNM) has a type specimen which was not borrowed. Dr Syoziro Asahina sent me a paratype of '*Imblattella*' *orchidae* Asahina which I have deposited in ANIC.]

Measurements are given in millimetres.

Imblattella impar (Hebard) (Figs 1A-D)

Neoblattella impar Hebard, 1920, p.58, pl.3, fig. 13 (♂ and ♀): 1921a, p.163; 1933, p.115.

Imblattella impar (Hebard): Bruijning, 1959, p.65; Princis, 1969, p.797.

HOLOTYPE (not examined)♂, Tabernilla, Canal Zone, Panama, A.H. Jennings; in USNM.

MATERIAL EXAMINED

PARATYPES: PANAMA. ANSP: Porto Bello, 1♂ (terminalia slide 410), 15.ii.1911, E.A. Schwarz; Alhajuelo, 1♂, 17.iv.1911, 2♂♂, 9.iv.1911, A. Busck; Bejuco Riv., 1♂, Wm. Schaus.

DESCRIPTION

Male. Interocular space less than distance between antennal sockets. Tegmina and wings fully developed, former with discoidal sectors longitudinal. Hind wings with proximal costal veins distinctly clubbed; discoidal, median, and cubitus veins straight, latter with 4-5 complete and 0 incomplete branches, apical triangle small (Fig. 1B). Front femur Type A_2; pulvilli present on 4 proximal tarsomeres, tarsal claws symmetrical, minutely serrated, arolia present. Abdominal terga unspecialised. Supraanal plate with medial portion broadly produced (Fig. 1A). Subgenital plate strongly asymmetrical, styles small, cylindrical, located on and near left posterior corner of plate; left style slightly larger, bearing some small, dark, robust spines, these absent from right one, interstylar margin an elongated oblique process bearing couple of rows of dark robust spines on proximal half (Figs 1C,D). Genitalia as in Fig. 1C; hook on right side.

Colouration. Brown. Heads of the specimens are discoloured. According to Hebard, there are '... 4 vertical lines on occiput, a moderately broad band between eyes, a moderately broad band, convex ventrad, between ocelli and face maculate with blackish brown'. Pronotal disk light brown with picturing and dots of dark brown. Tegmina transparent, light brown. Wings with non-uniform brownish tinge. Abdominal terga light brown with dark suffusions on distal segments. Abdominal sterna with shiny black maculation mesad on proximal segments.

Measurements. Length, 9.0-11.1; pronotum length x width, 2.6-2.9 x 3.3-3.6; tegmen length, 10.8-11.8.

REMARKS

Neoblattella Shelford is a large South and Central American genus of Blattellidae, and the males show a great diversity of subgenital plate and style morphology. Hebard described many species and separated them into species-groups, but did not provide diagnostic characters for these groups. Bruijning (1959) raised some of Hebard's species-groups to genera, and selected

Neoblattella impar as the type species of *Imblattella* and included *Neoblattella litosoma* Hebard as a second species with a general statement that the species included Hebard's *impar*-species group. Princis (1969, pp.796-798) listed 14 species in *Imblattella*, most of them transferred from *Neoblattella*, and included *Neoblattella panamae* as a new combination.

Hebard (1920, p.58) pointed out that the male subgenital plate of *impar* is '... of a type in no way comparable to that found in any of the species ...' of *Neoblattella*, or '... in any of the forms of Blattellites'. I consider the subgenital plate and style morphology important generic characters in this group of cockroaches. *Imblattella panamae* agrees with all the diagnostic characters of *Shelfordina* and I am transferring the species to that genus. The subgenital plate and styles of *Imblattella impar* are so unique that it may represent a monotypic genus.

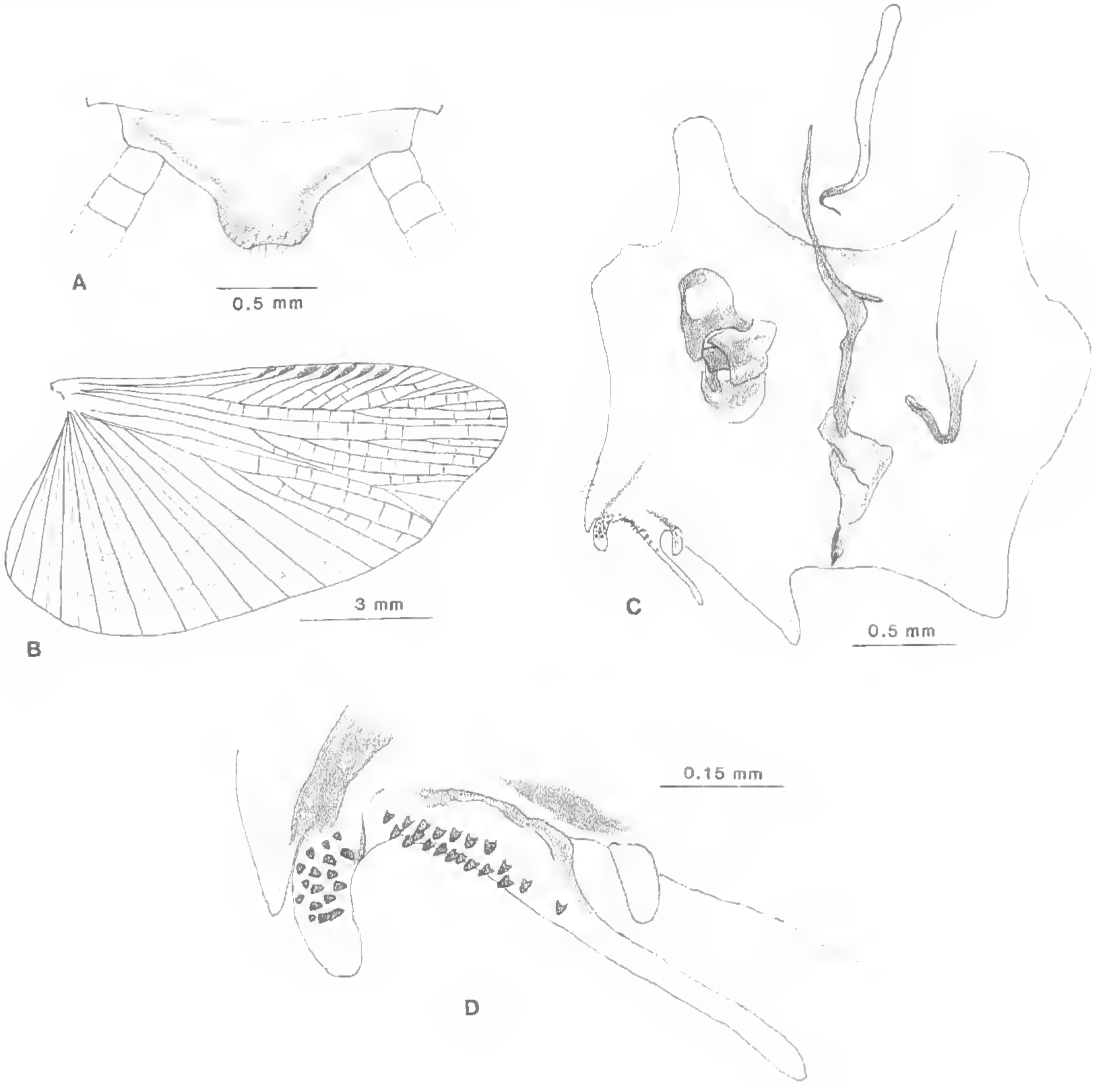

FIG. 1. *Imblattella impar* (Hebard), ♂ paratype from Alhajuelo, Panama: A, Supraanal plate (dorsal); B, Hind wing; C, Subgenital plate and genitalia (dorsal); D, Left corner of subgenital plate (dorsal).

Shelfordina Hebard

Shelfordina Hebard, 1929, p.46; Princis, 1969, p.871.
Shelfordella (*nec* Adelung): Hanitsch, 1933, p.126; Princis, 1951, p.57.
Possoina Strand, 1934, p.275; Bruijning, 1947, p.218; Princis, 1951, p.57.
Ebnerella Hanitsch, 1935, p.14; Princis, 1951, p.57.

TYPE SPECIES

Shelfordina fuscocastanea (Hanitsch), here selected [= *Phyllodromia terminalis* (*nec* Brunner), Hebard, 1929, p.46]. Hebard had 3 specimens when he selected *terminalis* as the type species of *Shelfordina*. One is a male of *fuscocastanea* and the other 2 are females of *Shelfordina terminalis minor* (Hanitsch) which I am raising to specific rank. Since Hebard misidentified the type species I intend to apply to the commission to designate *fuscocastanea* as the type species because there is no question as to the identification of Hebard's male specimen. A male specimen of *terminalis* from Borneo, the type locality, is unknown; I have seen a male from Sumatra which I have provisionally determined as that species.

One of Hebard's diagnostic characters of *Shelfordina* was '... sexes dissimilar, female with reduced organs of flight reaching apex of abdomen only.' Hanitsch (1933, p.126) found that Hebard had misidentified the specimens he used for his description of the genus and the above 'diagnostic' character was invalid. Hanitsch renamed the genus *Shelfordella*. However, *Shelfordella* was preoccupied and Strand (1934, p.275) replaced it with *Possoina*. In the interim, learning that *Shelfordella* was preoccupied, Hanitsch (1935, p.14), renamed it *Ebnerella*. Hanitsch had no valid reason for discarding Hebard's original name and Princis (1951, p.57, footnote 2) synonymised the 3 invalid names.

DIAGNOSIS

Tegmina and wings usually fully developed, sometimes reaching only to end of abdomen; hind wings may be shorter than tegmina, sometimes almost vestigial (Fig. 10J). Discoidal sectors of tegmina longitudinal or sublongitudinal (Figs 6E,7G,8F). Hind wing with some costal veins (usually the unbranched ones) clubbed (Fig. 11F), or thickened (Fig. 19D); discoidal vein straight, simple; median vein straight, usually simple, rarely with small apical branch; cubitus vein usually straight, rarely weakly concave, with 0 (rarely) to 5 complete branches, incomplete rami almost invariably absent, apical triangle present (except in greatly reduced wings). Front femur Type A_2, or A_3 (if latter, first terminal spine only slightly longer than preceding one); pulvilli present on 4 proximal tarsomeres, tarsal claws symmetrical, specialised (ventral margins serrated) (Fig. 11E; teeth may vary from distinct to sub-obsolete), arolia present. ♂: Abdominal terga unspecialised (in 2 species eighth segment enlarged, bearing spaced setae: Fig. 19E). Exposed portion of subgenital plate symmetrical. Styles widely separated, usually with a stylelike structure arising near their bases (hereafter called accessory styles) giving appearance of 4 styles rather than 2 (cp. Fig. 11C,e, Fig. 2G). Supraanal plate transverse, symmetrical, right and left paraprocts similar plates, without spinelike processes (Fig. 11A). Genital hook on right side (Fig. 13B,e).

REMARKS

Princis (1969, p.871) listed 7 species of *Shelfordina* from Malacca, Sumatra, Mentawai Islands, Celebes, and Japan. Of these *S. japonica* (Shelford) is a *Symploce* (Asahina, 1974) and *S. erythrocephala* (Hanitsch) is an *Episymploce* (Roth, 1985a, p.211; 1986, p.180). In this paper I describe, redescribe, or discuss 17 species of *Shelfordina* of which 7 are new and 4 are new combinations.

The male genital hook on the right side places *Shelfordina* in the Pseudophyllodromiinae (= Plectopterinae of McKittrick, 1964). The females in this subfamily usually do not rotate the ootheca prior to depositing it. A female of *Shelfordina digitata* (Fig. 2F), and one of *S. orchidae* were carrying oothecae in the vertical position, and they probably deposit the egg case from this position.

SPECIES-GROUPS OF *SHELFORDINA*

Based on the male subgenital plate and accessory styles I place species of *Shelfordina* in 3 species-groups as follows:

1. *digitata* species-group: Accessory styles absent; interstylar margin unmodified. Species: *digitata*.
2. *latimarginata* species-group: Accessory styles present, right and left ones similar in shape; interstylar margin strongly modified, bearing a pair of large, lobelike structures. Species: *jarakae*, *latimarginata*, *sumatrensis*.
3. *fuscocastanea* species-group: Accessory

styles present, right and left ones similar or distinctly different in shape; interstylar region not strongly modified, without setose lobes. Species: *cooki*; *fuscocastanea*; *minor*; *orchidae*; *panamae*; *philippinensis*; *robertsi*; *spinistylifera*; *terminalis*; *tozerensis*; *uniformis*; *yeatesi*; *wailimensis*.

Before receiving the type of *Shelfordina uniformis*, I considered erecting a fourth group in which the right and left accessory styles are strongly dissimilar; 2 species, *spinistylifera* and *wailimensis* would have been assigned to this group. However, *S. uniformis* has similar right and left accessory styles (placing it in the *fuscocastanea* group), but its median genital phallomere and eighth abdominal tergum are so similar to those of *spinistylifera* that I consider them to be more closely related than *spinistylifera* is to *wailimensis*.

KEY TO MALES OF *SHELFORDINA*

The male of *S. minor* is not known, but if its tegmina are similar to the female's (clear apical region), it will key to *terminalis*.

1. Accessory styles absent (Fig. 2G) (*digitata* species-group). (Mentawai Islands) .... *digitata*

Accessory styles present, giving the appearance of 4 styles (e.g., Fig. 11C,e) 2

2. Right and left accessory styles similar, or almost similar in shape (e.g., Figs 6G,14C) 3

Right and left accessory styles strongly dissimilar in shape, left one larger than right one (Fig. 20G) 15

3. Interstylar region strongly modified with 2 large lobes densely covered in part with setae (Figs 3H,4E,5F). (*latimarginata* species-group) 4

Interstylar region not as above (*fuscocastanea* species-group) 6

4. Pronotal disk light brown without distinct markings (Fig. 5C). Region between interstylar lobes roundly raised, setose (Fig. 5F). (Sumatra) .... *sumatrensis*

Pronotal disk with large light or dark reddish brown macula (Figs 3A,B,4A). Region between interstylar lobes not as above (Figs 3H,4E).. 5

5. Apex of median genital phallomere hardly enlarged (Fig. 3H). (Mentawai Islands) ...*latimarginata*

Apex of median genital phallomere greatly enlarged, rounded (Fig. 4E). (Pulo Jarak) .... *jarakae*

6. Tegmina reddish brown except for transparent colourless apical zone (Fig. 6E). (Borneo, Sumatra) .... *terminalis*

Tegmina not as above 7

7. Head with broad, brownish, transverse band on vertex, face very pale, immaculate (Fig. 12A). (Japan, Australia) .... *orchidae*

Head not as above 8

8. Accessory styles with 3 or 4 dark spines on inner lateral margins (Fig. 9C). (Panama) ...*panamae*

Accessory styles not as above 9

9. Apical margins of accessory styles with small setae; ventral surface of subgenital plate with small mound bearing group of dark setae anterior to each accessory style (Fig. 8D). (Sumatra) .... *fuscocastanea*

Accessory styles not as above. Mound-bearing setae anterior to accessory styles absent 10

10. Accessory styles short, bulbous, apically bifid (Fig. 16F). Tegmina and wings reaching to about end of abdomen. (Australia)........... *cooki*

Accessory styles not bulbous. Tegmina and wings extending beyond end of abdomen 11

11. Head with a pair of transverse bands between ocellar spots and antennal sockets (Fig. 10C). Pronotum as in Fig. 10A. Interstylar margin convexly rounded (Fig. 10D). (Philippines) .... *philippinensis*

Head, pronotum, and interstylar margin not as above 12

12. Cubitus vein of hind wing with 3-5 complete branches (Figs 14D,19D) 13

Cubitus vein of hind wing with 1 or 2 complete branches (Figs 17B,18D) 14

13. Accessory styles with 2 or 3 small apical spines (Figs 14C, 15A). Eighth abdominal tergum not enlarged, without scattered setae. (Australia) ....*tozerensis*

Accessory styles spinelike, without apical spines or setae (Fig. 19G). Eighth abdominal tergum enlarged bearing numerous spaced setae (Fig. 19E). (Celebes) .... *uniformis*

14. Interstylar margin undulate with pair of widely separated setal brushes (Fig. 17E). (Australia) ....*yeatesi*

Interstylar margin trigonal, without setal brushes (Fig. 18E). (Australia) .... *robertsi*

15. Eighth abdominal tergum enlarged, bearing scattered spaced setae (as in Fig. 19E; also see Roth, 1985b: Fig. 12G) (Sabah) .... *spinistylifera*

Eighth abdominal tergum not enlarged, without scattered setae (Sumatra) .... *wailimensis*

Shelfordina digitata (Hanitsch) (Figs 2A-G)

Neoblattella digitata Hanitsch, 1928, p.18, pl.1, fig.7 (♂ and ♀).
Shelfordella digitata (Hanitsch): Hanitsch, 1933, p.126.
Ebnerella digitata (Hanitsch): Hanitsch, 1935, p.14.
Shelfordina digitata (Hanitsch): Princis, 1969, p.872.

HOLOTYPE (not examined)
Mentawai Islands: in HDEO.

MATERIAL EXAMINED
PARATYPES: Mentawai Islands, HDEO: Siberut, 1♂ (terminalia slide 232), 26.ix.1924, H.H. Karny, Type Orth. $329^3/6$; Sipora, 1♀ (with attached ootheca), 31.x.1924, H.H. Karny, Type Orth. $329^2/6$.

DESCRIPTION
Male. Interocular space less than distance between antennal sockets (Fig. 2C); palpal segments 3 and 4 each longer than segment 5. Pronotum subelliptical (Fig. 2B). Tegmina and wings fully developed extending beyond end of abdomen, former with discoidal sectors longitudinal or almost so. Hind wing with subcosta and unbranched costal veins thickened on distal halves, discoidal, median and cubitus veins straight, latter with 5 complete and 0 incomplete branches, apical triangle small (Fig. 2E). Front femur Type A3; pulvilli on 4 proximal tarsomeres, tarsal claws symmetrical, ventral margins minutely toothed, arolia present. Abdominal terga unspecialised. Supraanal plate transverse, trigonal, apex weakly indented; right and left paraprocts similar, weakly defined plates (Fig. 2D). Subgenital plate symmetrical, styles similar, cylindrical, widely separated, accessory styles absent, interstylar margin straight, unmodified (Fig. 2G). Genitalia as in Fig. 2G; hook on right side, apex acute without apical spine or preapical incision; median phallomere slender, terminating in threadlike filament, sclerotised plate and 2 groups of setal brushes.

Colouration. Head reddish brown, clypeus and labrum pale (Fig. 2C). Pronotum with reddish brown maculae on anterior half, blackish brown on posterior region, background colour at centre of disk yellowish, broad lateral regions hyaline (Fig. 2B); the dark pattern apparently varies (cp. Hanitsch, 1928, pl.1, fig.7). Tegmina with mediastinal area subhyaline, pale yellowish, remainder dark amber to light yellowish brown. Hind wing clouded on distal half of costal vein region and anterior field, and behind apical triangle (Fig. 2E). Abdominal terga light brown, darkly infuscated laterally, round spots sublaterally. Abdominal sterna light brown with lateral stripes and sublateral dots. Cerci yellowish brown, basal 2 segments dark brown.

Female. Cubitus vein hind wing with 3 complete branches (1 bifurcate). Supraanal plate strongly transverse, hind margin shallowly convex. Pronotal pattern as in Fig. 2A. Abdominal terga extensively infuscated. Abdominal sterna with large medial zone and most of subgenital plate dark brown.

Ootheca. The female is carrying an ootheca in vertical position, keel dorsal (Fig. 2F). The egg case is black with very narrow keel, respiratory serrations very small; surface covered with transverse striae, longitudinal cell divisions absent; height, 2.6mm, length, 5.4mm, width, 2.0mm.

Measurements (♀ in parentheses). Length, 12.5 (12.8, contracted); pronotum length x width, 4.0 x 5.2 (4.5 x 5.7); tegmen length, 15.0 (14.5).

REMARKS
Were it not for having Type A front femur, this species could be mistaken for a member of the *ceylanica* species-group of *Margattea* (front femur Type B).

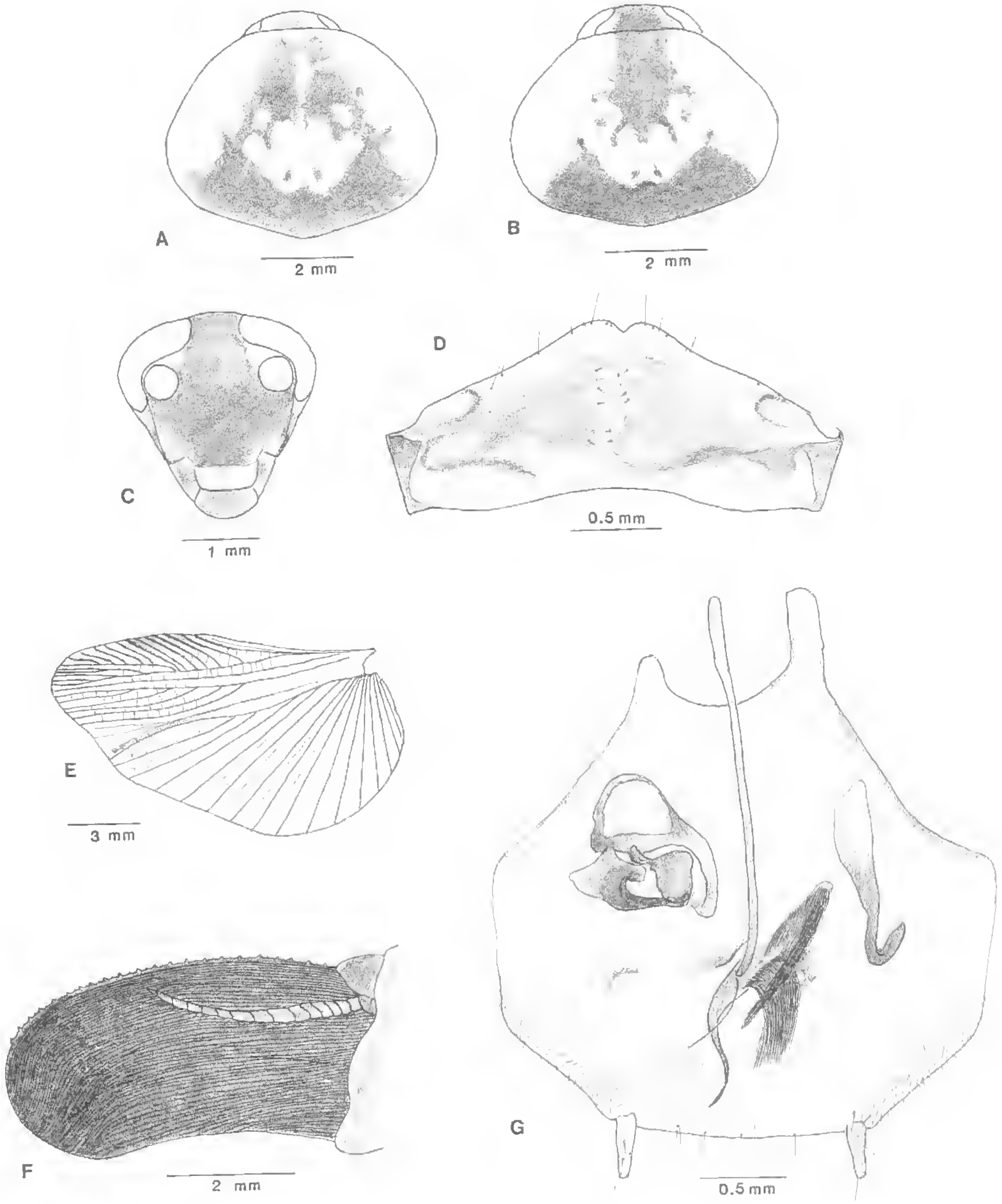

FIG. 2. *Shelfordina digitata* (Hanitsch), paratypes form Mentawai Islands: A, ♀ from Sipora, pronotum; B-E, G, ♂ from Siberut: B, Pronotum; C, Head; D, Supraanal plate and paraprocts (ventral); E, Hind wing; F, Ootheca attached to abdomen (lateral; from ♀ shown in Fig. A); G, Subgenital plate and genitalia (dorsal)

Shelfordina latimarginata (Hanitsch) n.comb. (Figs 3A-H)

Neoblattella latimarginata Hanitsch, 1928, p.19 (♂ and ♀).

?*Shelfordina latimarginata* (Hanitsch): Hebard, 1929, p.9.

Shelfordella latimarginata (Hanitsch): Hanitsch, 1933, p.126.

Ebnerella latimarginata (Hanitsch): Hanitsch, 1935, p.14.

Possoina latimarginata (Hanitsch): Bruijning, 1948, p.88.

Shelfordella jarakae (Hebard): Hanitsch, 1933, p.126 (incorrectly synonymised with *latimarginata*; Princis, 1969, p.872 (listed as a synonym of *latimarginata*).

HOLOTYPE (not examined)
♂, Mentawai Islands; in HDEO.

MATERIAL EXAMINED
PARATYPES. MENTAWAI ISLANDS. HDEO: Sipora, 1♂ (terminalia slide 231), 22.x.1924, H.H. Karny, Type Orth. 330^3/5.
WEST SUMATRA. HDEO: Siberut Island, 1♂, ix.1924, C.B.K. and N.S., Type Orth. 330^4/5.

DESCRIPTION

Male. Interocular space less than distance between antennal sockets (Fig. 3C); palpal segments 3 and 4 each longer than segment 5. Pronotum subelliptical (Figs 3A,B). Tegmina and wings extending beyond end of abdomen, discoidal sectors of former longitudinal (Fig. 3F). Hind wing with unbranched costal veins thickened on distal halves, discoidal, median and cubitus veins straight, median with a small apical bifurcation, cubitus vein with 5 complete (1 with 2 small branches) and 0 incomplete branches, apical triangle distinct (Fig. 3G). Front femur Type A_3; pulvilli on 4 proximal tarsomeres, tarsal claws symmetrical, minutely toothed, arolia present. Abdominal terga unspecialised. Supraanal plate transverse, trigonal, apex of hind margin narrowly truncate, right and left paraprocts similar plates (Fig. 3D). Subgenital plate symmetrical, distal region directed dorsad (Fig. 3E); styles slender, cylindrical, similar, widely separated with accessory styles beneath them; interstylar lobe with pair of large structures their distodorsal surfaces covered with small dark spines (Figs 3E,H). Genitalia as in Fig. 3H: hook on right side with small apical spine, entire structure covered by sclerotised plate; median phallomere, slender, curved, rodlike, apically modified as rounded membrane; below phallomeres a large membrane, distal margin bearing huge brush composed of densely packed dark curved setae (in pinned male from Siberut Island this brush, which is normally hidden in the genital chamber, was extruded and exposed).

Colouration. Head with reddish brown occiput and vertex, transverse whitish band above antennal sockets, then a large reddish brown macula with pale areas within it, region below dark pattern, yellowish brown (Fig. 3C). Pronotum with broad reddish brown macula, pale areas within it, oblique lateral margins outlined opaque whitish, regions surrounding coloured area hyaline (Fig. 3B); pattern varies, disk may be light with dark oblique sides, whitish margins absent (Fig. 3A). Tegmina with mediastinal and costal vein area pale brownish yellow, remainder reddish brown, darker in anal area (Fig. 3F). Wings pale fuscous, darker in costal vein region and distal part of anterior field, and behind apical triangle which is pale (Fig. 3G). Abdominal terga yellowish brown, mottled with dark brown and lateral dots. Abdominal sterna yellowish brown, segments on basal half darker; subgenital plate dark brown on distal upturned portion below paired stylelike structures. Legs yellowish brown. Cerci dorsally light yellowish brown, basal segments darker.

Female. Not seen.

Measurements. Length, 13.0; pronotum length x width, 3.8-4.1 x 4.8-5.3; tegmen length, 15.0-16.8.

REMARKS

Differences in male genitalia and interstylar margin of subgenital plate clearly show that *latimarginata* and *jarakae* are valid taxa and not conspecific as claimed by Hanitsch. The brush-like membrane underlying the genital phallomeres is much larger in *latimarginata* than in *jarakae* or *sumatrensis*, the other two members in the species-group.

Shelfordina jarakae Hebard (Figs 4A-E)

Shelfordina jarakae Hebard, 1929, p.48, pl.3, figs 3,4 (♂): Princis, 1969, p.872 [listed as a synonym of *S. latimarginata* (Hanitsch)].

Shelfordella jarakae (Hebard): Hanitsch, 1933, p.126 [incorrectly synonymised with *S. latimarginata* (Hanitsch)].

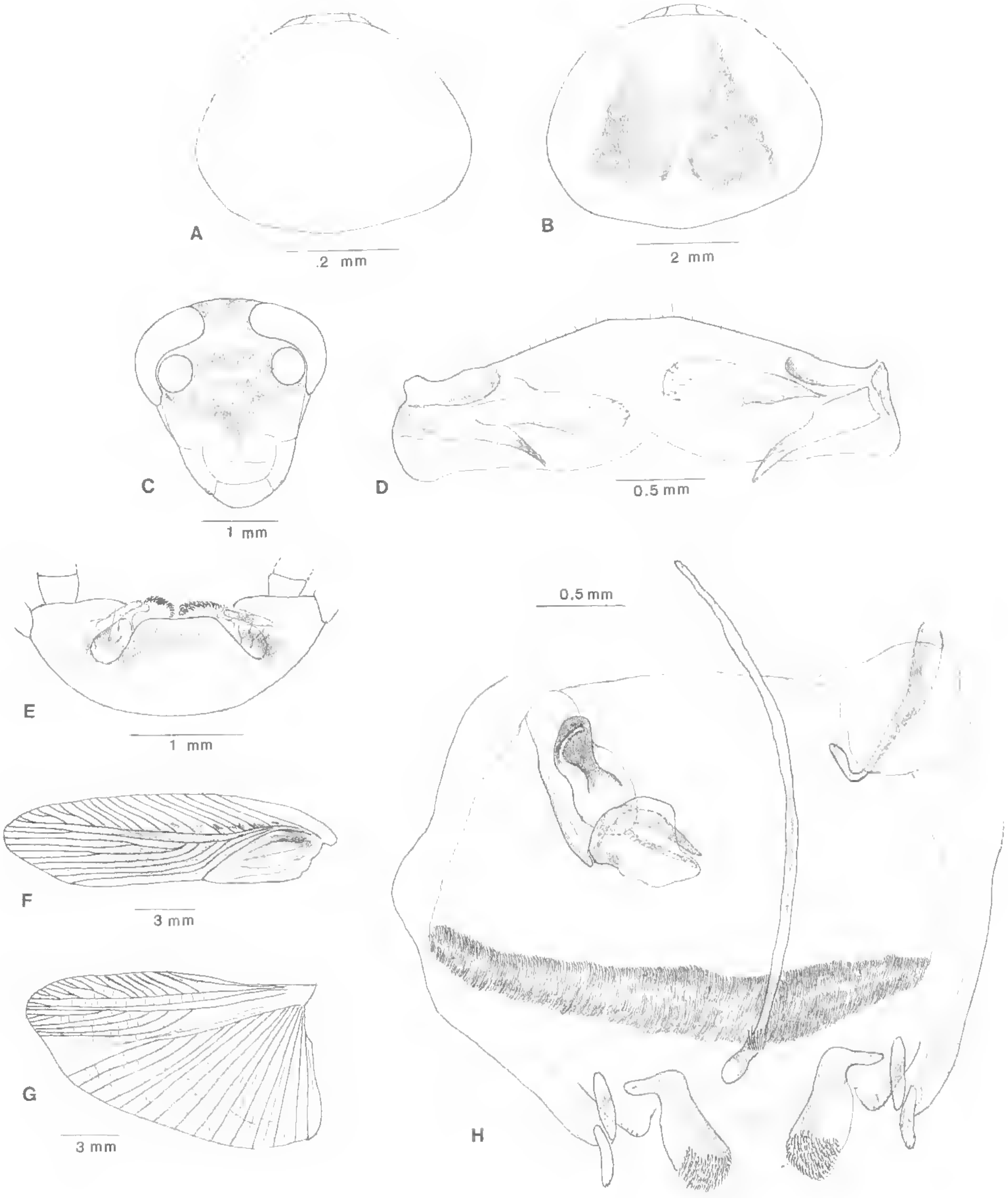

FIG. 3. *Shelfordina latimarginata* (Hanitsch), ♂ paratypes: A, from Siberut Island, West Sumatra, pronotum; B-H, from Sipora, Mentawai Islands; B, Pronotum; C, Head; D, Supraanal plate and paraprocts (ventral); E, Subgenital plate (rear-oblique view); F, Left tegmen; G, Left hind wing; H, Subgenital plate and genitalia (dorsal).

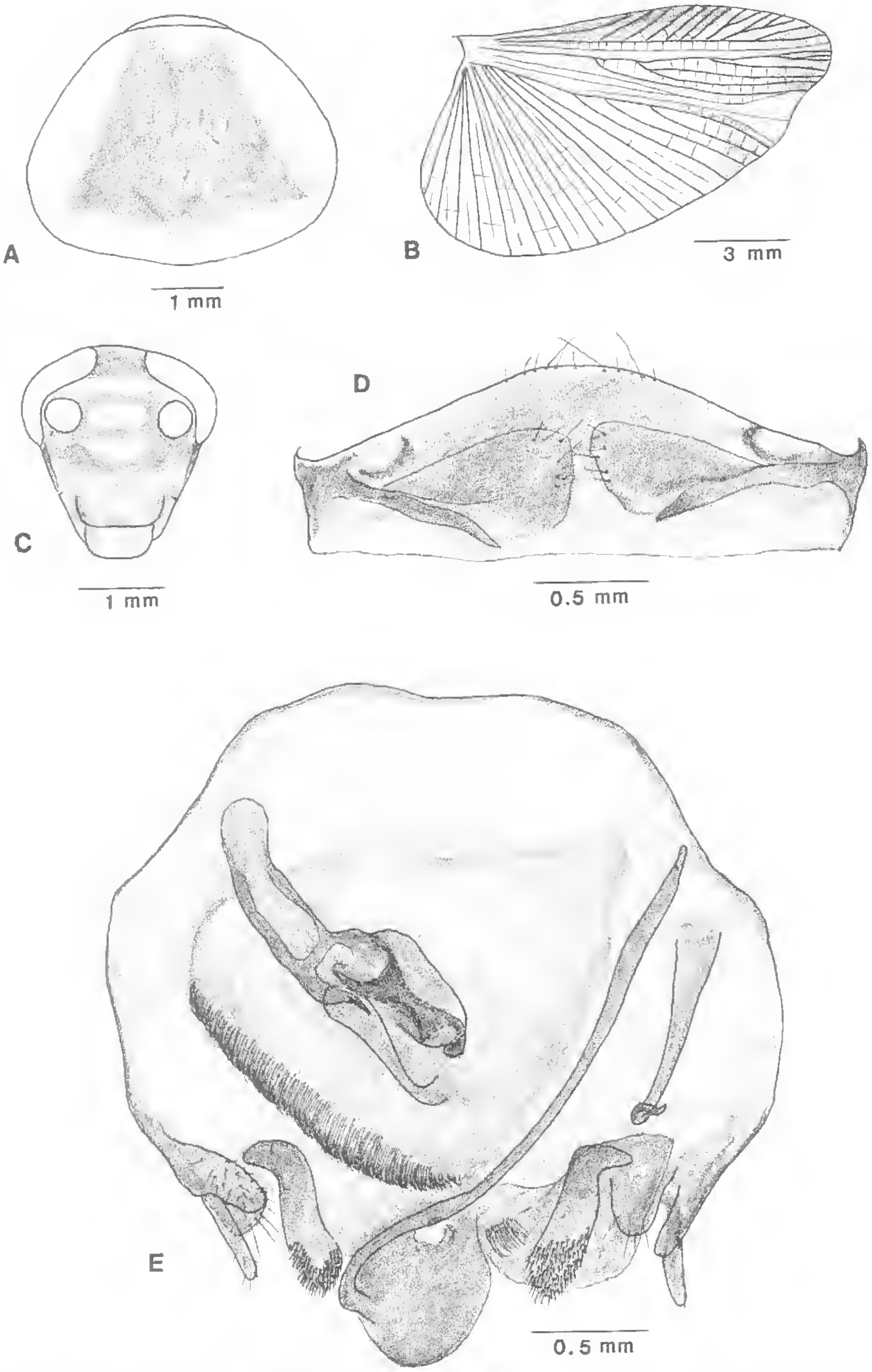

FIG. 4. *Shelfordina jarakae* Hebard, ♂ holotype: A, Pronotum; B, Hind wing; C, Head; D, Supraanal plate and paraprocts (ventral); E, Subgenital plate and genitalia (dorsal).

MATERIAL EXAMINED

HOLOTYPE: HDEO: ♂ (terminalia slide 230), Pulo Jarak, 14.iv.1921, V. Knight (with a Hanitsch label, *Neoblattella latimarginata* Han.).

DESCRIPTION

Male. Interocular space less than distance between antennal sockets (Fig. 4C). Pronotum subelliptical (Fig. 4A). Tegmina and wings fully developed reaching beyond end of abdomen. Hind wing with several costal veins clubbed, discoidal, median, and cubitus veins straight, latter with 4 complete (2 of them bifurcate) and 0 incomplete veins, apical triangle distinct (Fig. 4B). Front femur Type A_3; pulvilli present on 4 proximal tarsomeres, tarsal claws symmetrical their inner margins minutely toothed, arolia present. Abdominal terga unspecialised. Supraanal plate transverse, hind margin weakly trigonal, apex rounded, paraprocts similar plates (Fig. 4D). Subgenital plate symmetrical; styles slender, cylindrical, similar, each located near posterolateral corner of plate with stouter accessory style near its base; interstylar region with pair of large lobes densely covered with small spines on distal halves of dorsal surface; between these structures a large, round plate that seems to be the apex of the median genital phallomere (Fig. 4E). Genitalia as in Fig. 4E; hook on right side without apical or subapical spine or incision (in the drawing the hook is oriented with its apex directed upwards); median phallomere apparently expanded apically as a rounded plate; membrane beneath phallomeres with long row of dark setae.

Colouration. Head reddish brown, occiput darker with 3 light transverse bands on face (Fig. 4C). Pronotum with large subtrigonal reddish brown macula, its lateral margins outlined brownish yellow, lateral regions hyaline (Fig. 4A). Tegmina brownish yellow, hyaline in mediastine area and greater part of marginal field, then reddish brown becoming paler distad (see Hebard, 1929: pl.3, fig.3). Wings tinged with brown, apical triangle clear (Fig. 4B). Abdominal terga brownish yellow, each segment infuscated on distal half, with brown mesolateral dot. Abdominal sterna yellowish brown, darker brown lateral dots and in large proximal area and bilobate portion of subgenital plate. Legs brownish yellow, small flecks of darker brown at bases of most spines, ventral surfaces of hind femurs washed with that colour.

Female. Unknown.

Measurements. Length, 12.6; pronotum length x width, 3.5 x 4.5; tegmen length, 14.0.

REMARKS

Hanitsch considered *jarakae* a synonym of *latimarginata* undoubtedly because of the similarities in colour patterns and male terminal abdominal segments. However, differences in the median and left genital phallomeres and interstylar margins leave no doubt the 2 taxa are distinct.

Shelfordina sumatrensis n.sp. (Figs 5A-F)

MATERIAL EXAMINED

HOLOTYPE: ♂, Wai Lima, Z. Sumatra, Lampongs, no. 178, xi-xii.1921, Karny and Siebers; in HDEO.

PARATYPE. SUMATRA, HDEO: same data as holotype, 1♂, no. 86 (terminalia slide 233), 2♂♂, nos.197 and 394, 1♀, no.190 (labelled *Ebnerella* sp. by Hanitsch); Pedada-B, Lampongs, 1♂, i. 1922.

DESCRIPTION

Male. Interocular space less than distance between antennal sockets (Fig. 5A); palpal segments 3 and 4 each longer than segment 5. Pronotum subparabolic (Fig. 5C). Tegmina and wings fully developed extending beyond end of abdomen. Tegmina with discoidal sectors weakly oblique or longitudinal. Hind wing with subcosta and unbranched costal veins thickened distad; discoidal, median, and cubitus veins straight, the median usually simple (rarely with a small apical bifurcation), cubitus with 4-5 complete (one of the branches may be forked) and 0 incomplete branches, apical triangle small (Fig. 5E). Front femur Type A_2 or A_3 (if latter, first 'large' terminal spine only slightly longer than one preceding it). Abdominal terga unspecialised. Supraanal plate transverse, hind margin convex, right and left paraprocts similar plates (Fig. 5B). Subgenital plate symmetrical, distal half bent upwards at right angle (Fig. 5D); styles, slender, cylindrical widely spaced, at base of each a stouter accessory style; interstylar region strongly modified forming large rounded plate bearing pair of densely spined structures, floor between them longitudinally raised, setose (Fig. 5F). Genitalia as in Fig. 5F: hook on right side, slender, without subapical incision or spine, with sclerotised plate at basal end; median phallomere slender rod, apex unmodified; membrane beneath phallomeres greatly reduced, roughly anchor-shaped, distal area covered by small spines, the setae relatively light compared to those in *jarakae* and *latimarginata*.

Colouration. Head light brown, sometimes partially hyaline, without distinct markings (Fig. 5A); some specimens have faint indications of couple of transverse reddish brown bands. Pronotum with disk yellowish brown, without markings, surrounding region hyaline (Fig. 5C). Tegmina hyaline, light brown without markings. Hind wing with thickened region of costal veins dark, remainder with yellowish tinge, apical triangle clear (Fig. 5E). Abdominal terga and sterna light brown, former laterally infuscated, latter with large dark macula medially on anterior segments. Cerci light brown dorsally, apical segment dark. Male from Pedada has more extensive infuscation on abdominal segments, and head has more distinct reddish bands.

Female. Front femur Type A$_2$. Hind wing with 1 of 4 cubitus vein branches, bifurcate. Supraanal plate transverse, narrow, hind margin convex.

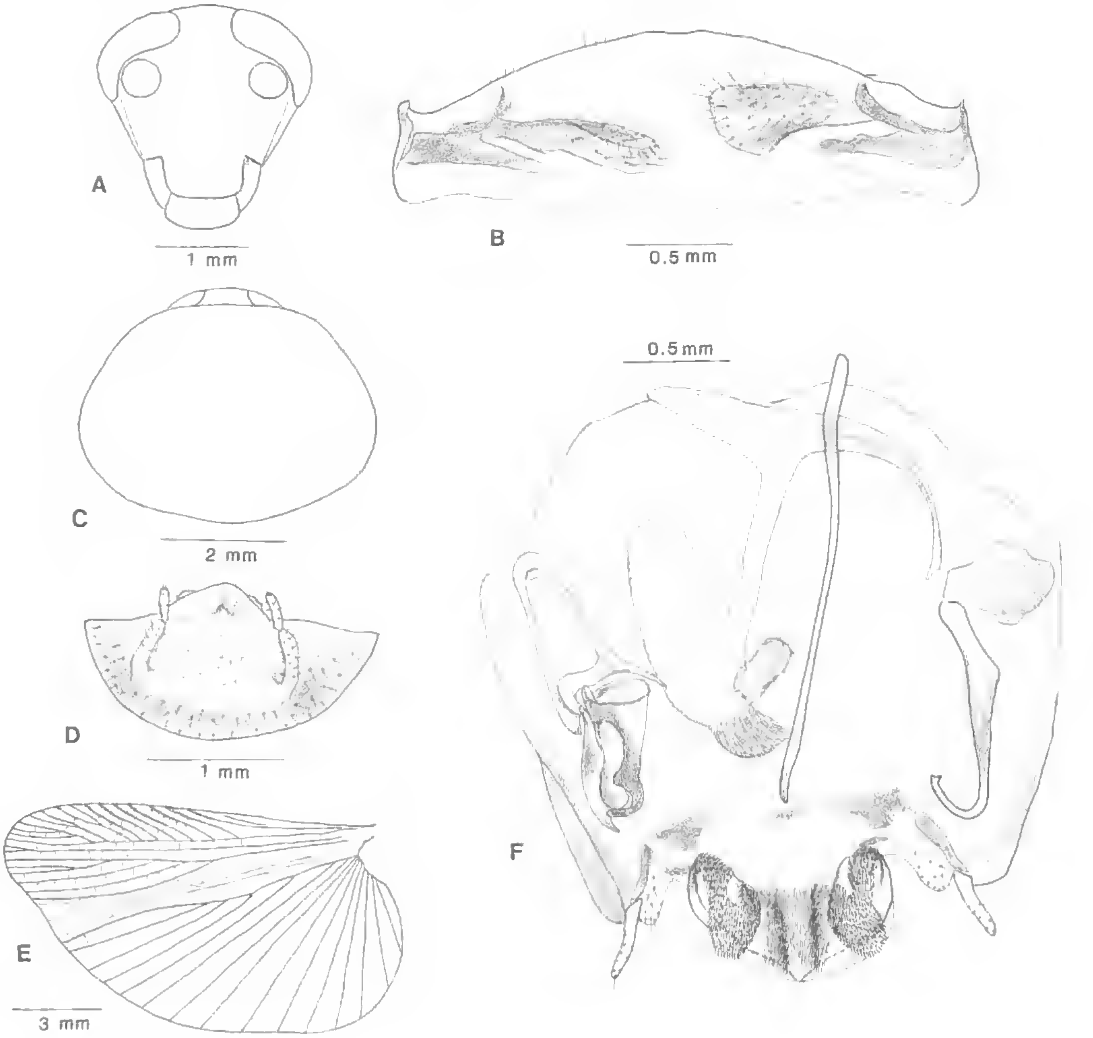

FIG. 5. *Shelfordina sumatrensis* n.sp., ♂♂. A,C,D, From holotype; B,E,F, from paratype, same locality as holotype: A, Head; B, Supraanal plate and paraprocts (ventral); C, Pronotum; D, Upturned region of subgenital plate (rear view); E, Hind wing; F, Subgenital plate and genitalia (dorsal).

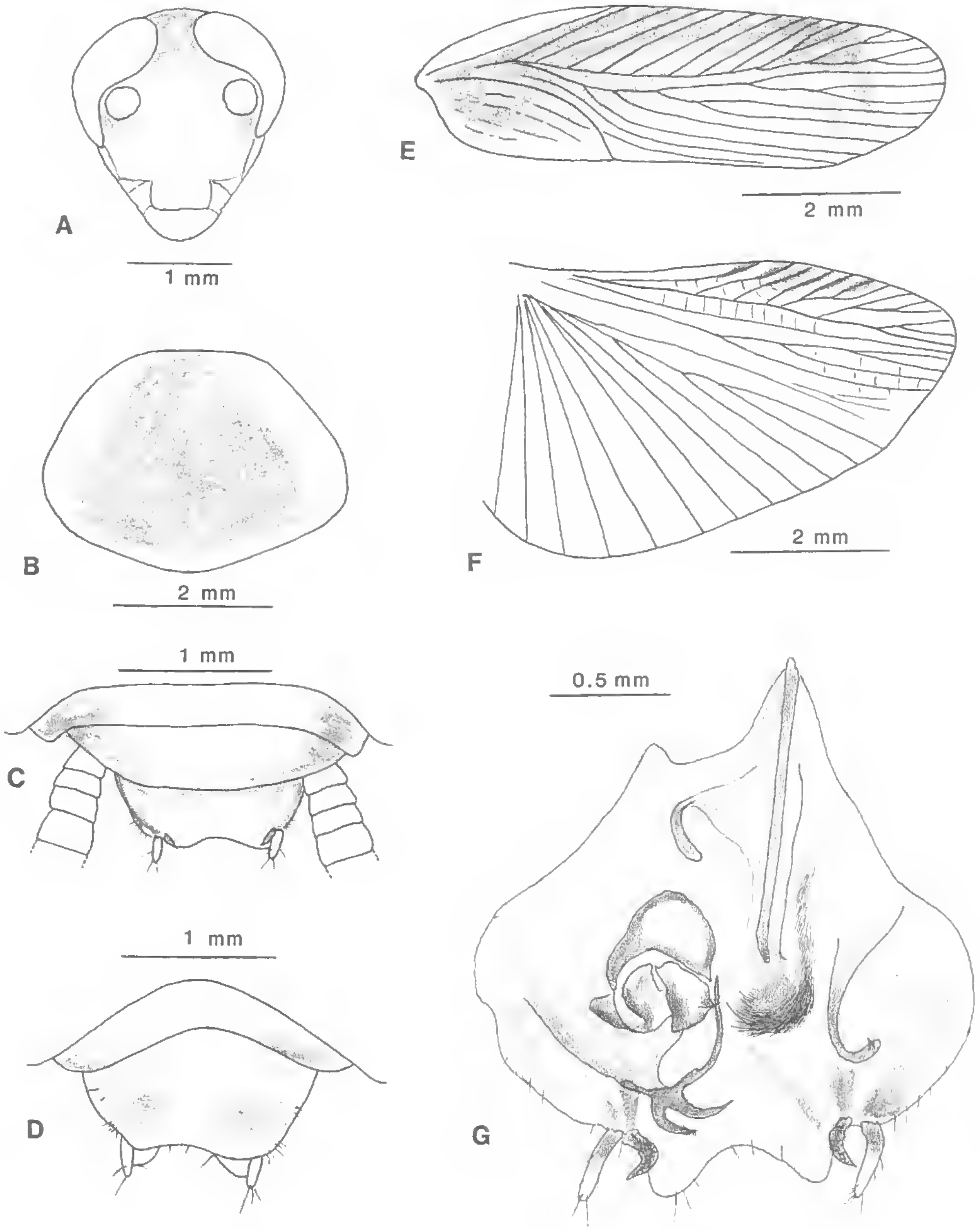

FIG. 6. *Shelfordina terminalis* (Brunner), ♂ from Wai Lima, Sumatra: A, Head; B, Pronotum; C, Supraanal and subgenital plates (dorsal); D, Subgenital plate (ventral); E, Tegmen; F, Hind wing; G, Subgenital plate and genitalia (dorsal).

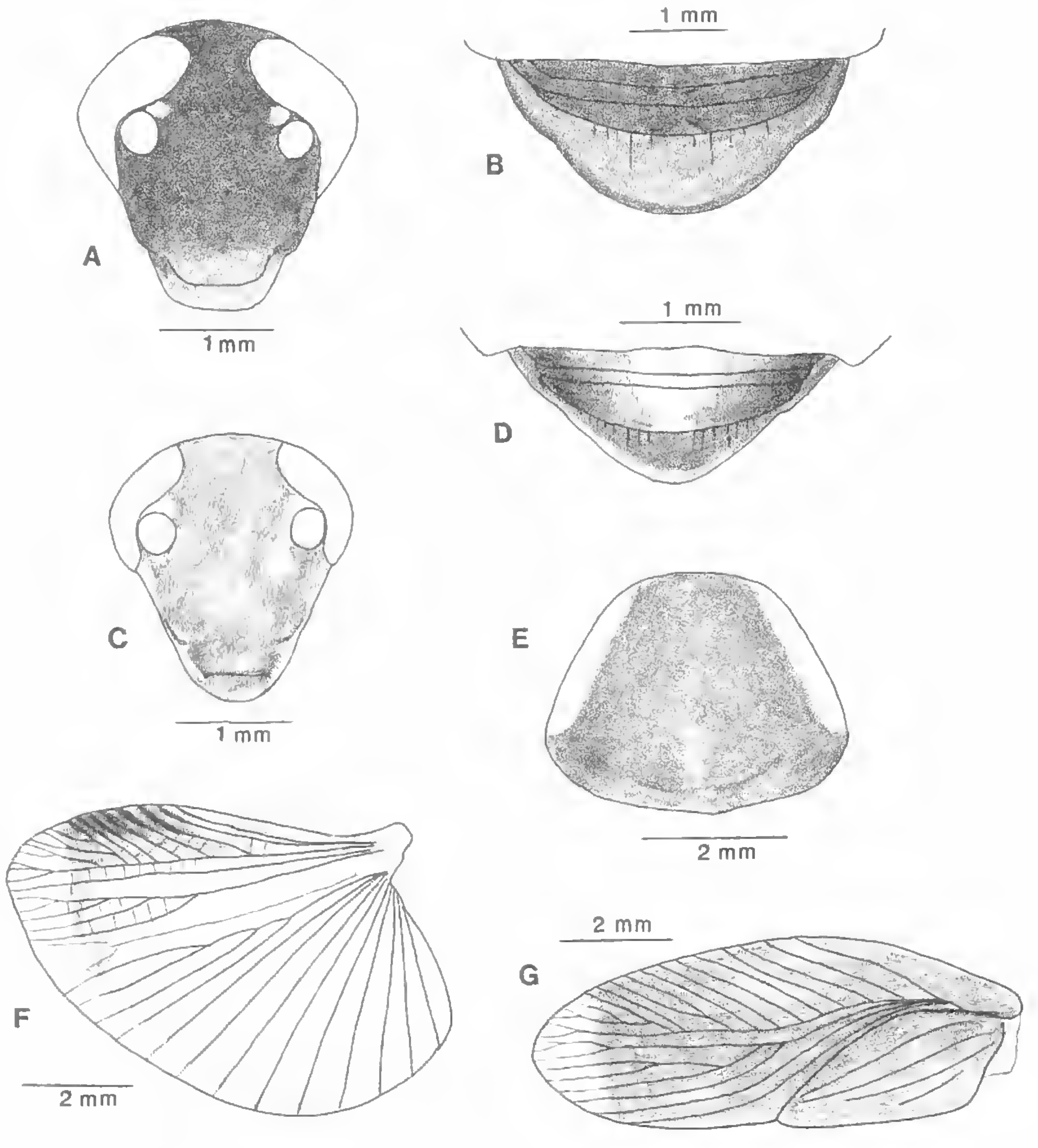

FIG. 7. *Shelfordina* spp. A,B, *S. terminalis* (Brunner), head, and terminal abdominal segments (dorsal) of ♀ holotype; C-G, *S. minor* (Hanitsch), ♀ from Fort de Kock, Sumatra: C, Head; D, Terminal abdominal segments (dorsal); E, Pronotum; F, Hind wing; G, Tegmen.

Subgenital plate with large dark reddish brown macula.

Measurements (♀ in parentheses). Length, 11.0-12.7 (13.5); pronotum length x width, 3.5-4.0 x 4.5-4.8 (3.8 x 5.1); tegmen length, 14.5-15.5 (13.4).

REMARKS

The subgenital plate, styles and their associated structures places *sumatrensis* close to *latimarginata* and *jarakae*. The median phallomere with its unmodified apex is more like that of *latimarginata*. The left genital phallomere is closer to that of *jarakae*. The greatly reduced membrane beneath the phallomeres, and the shape of the interstylar lobe and spination of the brushes, are distinctly different in *sumatrensis*. Superficially *sumatrensis* can be distinguished from its 2 close relatives by the absence of markings on pronotum and tegmina.

Shelfordina terminalis (Brunner)
(Figs 6A-G, 7A-B)

Phyllodromia terminalis Brunner, 1898, p.206, pl. 16, fig. 11 (♀); Kirby, 1904, p.93; Shelford 1908, p.13; Hanitsch, 1923, p.414.

Shelfordina terminalis (*nec* Brunner): Hebard, 1929, p.47 [♀ = *Shelfordina minor* (Hanitsch); ♂ = *Shelfordina fuscocastanea* (Hanitsch), pl. 3, figs 1, 2]; Princis, 1969, p.871.

Shelfordella terminalis (Brunner): Hanitsch, 1933, p.126 (♂).

Possoina terminalis (Brunner): Strand, 1934, p.275; Bruijning, 1948, p.88.

Ehnerella terminalis (Brunner): Hanitsch, 1935, p.14.

MATERIAL EXAMINED

HOLOTYPE: ♀, Borneo; in NMWA.

ADDITIONAL MATERIAL. SUMATRA. HDEO: Wai Lima, Z. Sumatra, Lampongs, 1♂ (terminalia slide 228), xi-xii 1921, Karny (with following labels in Hanitsch's handwriting '*Neoblattella terminalis* Brunner, ♂; *Shelfordella*).

DESCRIPTION

Male. Eyes very close together, space between them distinctly less than distance between antennal sockets (Fig. 6A). Pronotum subelliptical (Fig. 6B). Tegmina and wings extending well beyond end of abdomen, discoidal sectors of former longitudinal or sublongitudinal (Fig. 6E). Hind wing with costal veins thickened distad, discoidal, median, and cubitus veins straight, latter with 3 complete and 0 incomplete branches, apical triangle poorly defined (Fig. 6F). Front femurs and all tarsal claws missing (see ♀ description). Abdominal terga unspecialised. Supraanal plate strongly transverse, hind margin convex, not reaching hind margin of subgenital plate (Fig. 6C). Exposed portion of subgenital plate symmetrical, styles similar, cylindrical widely separated (Figs. 6C,D); near base of each style a shorter, curved dark articulated accessory style, interstylar margin concavely excavated (Fig. 6G). Genitalia as in Fig. 6G: genital hook on right side with preapical spine; median phallomere straight rod, apex unmodified; left phallomere with pair of sclerotised, curved, spinelike processes.

Colouration. Head reddish brown, darker on occiput and vertex (Fig. 6A). Pronotum with broad reddish brown area that extends from anterior margin almost to convex hind margin, most of lateral regions hyaline (Fig. 6B). Tegmina reddish brown except for transparent, colourless apical zone (Fig. 6E). Hind wing infuscated, thickened costal vein region somewhat darker, small area posterior to apical triangle also darker, apical region practically colourless (Fig. 6F). Abdominal terga light brown, laterally infuscated. Abdominal sterna brown, terminal segments darker. Cerci dorsally with segments 1-3, 9, 10, and 12 (apex) dark brown, others pale, ventrally segments darker but those in middle somewhat lighter than basal and apical ones.

Female (holotype). Interocular space considerably less than distance between ocellar spots and antennal sockets (Fig. 7A). Tegmina and wings extending well beyond end of abdomen, cubitus vein of latter with 4 complete branches. Supraanal plate strongly transverse, convex, not reaching hind margin of subgenital plate (Fig. 7B). Front femur Type A_2; pulvilli on 4 proximal tarsomeres, tarsal claws symmetrical, ventral margins with subobsolete teeth, arolia present.

Colouration. Head blackish with reddish tinge, clypeus and labrum yellowish brown (Fig. 7A). Pronotal disk dark reddish brown, lateral borders lighter reddish brown. Tegmina dark reddish brown, large apical region transparent, colourless. Hind wing with thickened costal vein region yellowish, distal borders of anterior and posterior fields almost colourless, remainder weakly infuscated. Abdominal terga light brown, lateral borders slightly darker, terminal segments blackish brown. Abdominal sterna reddish brown, subgenital plate blackish with reddish tinge. Cerci and legs reddish brown.

Measurements (♀ holotype in parentheses). Length, 8.3 (11.4); pronotum length x width, 2.6 x 3.7 (3.6 x 4.7); tegmen length, 11.5 (12.6).

REMARKS

Hebard (1929, p.46) had 2 females from Fort de Kock, Sumatra, which he determined as *terminalis* because their tegmina were '...suddenly transparent and whitish like ground glass, the other portions being dark.' He also identified a male from the same locality as the same species even though its tegmina lacked the transparent, colourless apical region. Hanitsch (1933, p.126) pointed out that this male was not *terminalis* and

Princis (1969, p.872) correctly listed it under *S. fuscocastanea*, whose type I have seen. Hanitsch had a male from Mt Poi, Sarawak, and Wai Lima, Lampong, Sumatra, which had tegminal markings like those of *terminalis* and he considered them that species. The male which I am describing here as *terminalis* is Hanitsch's Wai Lima specimen; I have not seen his Mt Poi male. The females from Fort de Kock were named by Hanitsch *terminalis minor*, but I have raised this subspecies to specific rank (see below).

Shelfordina minor (Hanitsch)
(Figs 7C-G)

Neoblattella terminalis Brunner, *minor* Hanitsch, 1929b, p.273 (♀).

Shelfordina terminalis (*nec* Brunner): Princis, 1969, 872 [♀ only; ♂ = *S. fuscocastanea* (Hanitsch)].

Shelfordina terminalis minor (Hanitsch): Princis, 1969, p.872.

Material Examined

Holotype: ♀, Fort de Kock, Sumatra, 920m, 1925, E. Jacobson; type Orth. $354^1/3$ in HDEO.

Paratype: Pulo Tioman, HDEO: 1♀, vi.1915, V. Knight, Type Orth.$354^2/3$. Additional material. Sumatra. ANSP: Fort de Kock, 1♀ (genitalia slide 415), 19.xi.1913. 1♀, 920m, xii.1921, E. Jacobson (both reported as *S. terminalis* by Hebard, 1929, p.47).

Description

Male. Unknown (see remarks).

Female. Eyes wide apart, interocular space slightly less than distance between antennal sockets (Figs 7C). Pronotum subparabolic (Fig. 7E). Tegmina and wings somewhat reduced reaching only slightly beyond end of abdomen, discoidal sectors of former, sublongitudinal (Fig. 7G). Hind wings with costal veins thickened distad, discoidal and median veins straight, simple; cubitus vein weakly concave with 4 complete and 0 incomplete branches, apical triangle present (Fig. 7F). Front femur Type A_3 (first of 3 terminal spines may be only slightly longer than preceding one); pulvilli present on 4 proximal tarsomeres, tarsal claws symmetrical with few subobsolete teeth, arolia present. Terminal abdominal segments as in Fig. 7D.

Colouration. Head reddish brown (Fig. 7C) Pronotum with lateral borders yellowish, remainder dark reddish brown (Fig. 7E). Tegmina reddish brown, apical region transparent, appearing whitish (Fig. 7G). Hind wing with broad distal region practically colourless, remainder infuscated, thickened costal vein region somewhat darker, veins dark except in pale apical zone (Fig. 7F). Abdominal terga of terminal segments with broad lateral borders blackish, or dark brown, remainder light brown which extends medially to hind margin of supraanal plate. Abdominal sterna reddish or blackish brown. Cerci dark blackish brown with 2 pale preterminal segments. Coxae infuscated, remaining parts of legs reddish brown.

Measurements. Length, 9.0-10.6; pronotum length x width, 3.1-3.3 x 4.0-4.6; tegmen length, 8.9-9.2.

Remarks

Because the apical region of the tegmina are transparent in Sumatran specimens, as they are in Brunner's Bornean *terminalis*, Hanitsch (1929b, p.273) described it as a subspecies, *minor*, stating that it differed from the nominate form in being smaller and in colour of the pronotum. There are other colour differences, but more importantly, the interocular space is distinctly greater (Fig. 7C) in *minor*, than it is in the holotype of *terminalis* (Fig. 7A), and for this reason I am raising Hanitsch's subspecies to specific rank. Because the eyes of the male from Wai Lima, Sumatra, are even closer together than are those of the female *terminalis*, I am provisionally identifying it as that species. It is not uncommon to find the interocular space somewhat different between the sexes of conspecific species, but the difference usually is less than that seen between Figs 6A and 7C, and more like that between Figs 6A and 7A. However, my interpretation of these 2 taxa should be confirmed by examining males from 'Borneo' and Fort de Kock, and females from Wai Lima.

Shelfordina fuscocastanea (Hanitsch)
(Figs 8A-G)

Neoblattella fusco-castanea Hanitsch, 1929b, p.274 (♂).

Ebernella fuscocastanea (Hanitsch), 1935, p.14.

Possoina fuscocastanea (Hanitsch): Bruijning, 1948, p.88.

Shelfordina terminalis (*nec* Brunner, 1898): Hebard, 1929, p.47, pl. 3, figs 1,2 [♂ only; ♀ = *Shelfordina minor* (Hanitsch), not *S. terminalis* (Brunner) as stated by Princis, 1969, p.872]

Shelfordina fuscocastanea (Hanitsch): Princis, 1969, p.872.

MATERIAL EXAMINED

HOLOTYPE: ♂, Fort de Kock, Sumatra, 920m, 1926, E. Jacobson; Type Orth. 355; in HDEO.

ADDITIONAL MATERIAL. SUMATRA. ANSP: same data as holotype, 1♂ (terminalia slide 416), i.1921 (misidentified as *S. terminalis* by Hebard, 1929).

DESCRIPTION

Male. (see Hebard, 1929, pl. 3, fig. 1, for habitus). Head slightly exposed beyond pronotum; interocular space less than distance between antennal sockets (Fig. 8A). Pronotum as in Fig. 8B. Tegmina and wings extending well

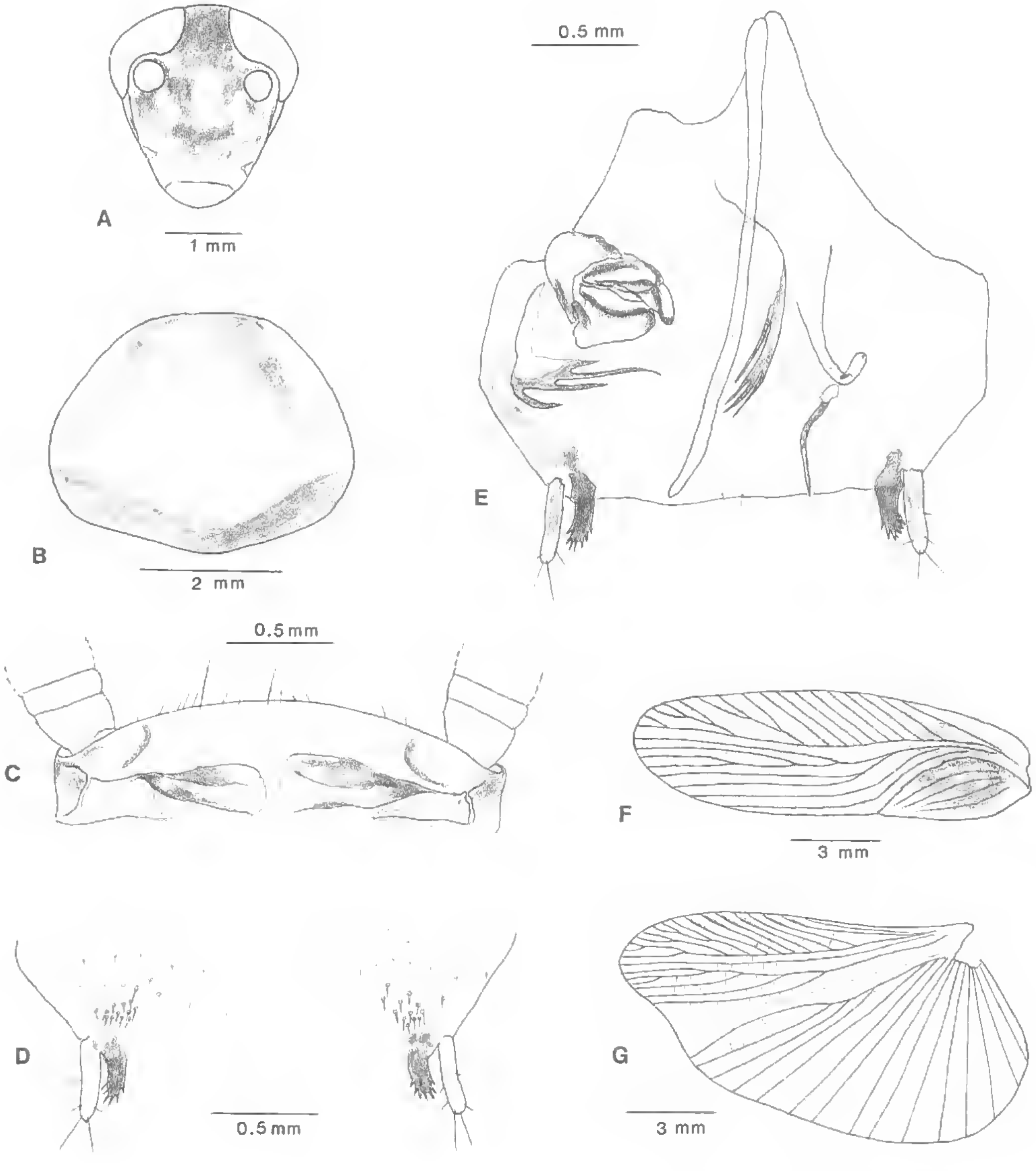

FIG. 8. *Shelfordina fuscocastanea* (Hanitsch), ♂♂ from Fort de Kock, Sumatra. A,B,F,G, From holotype: A, Head; B, Pronotum; C, Supraanal plate and paraprocts (ventral); D, Distal region of subgenital plate showing styles and accessory styles (ventral); E, Subgenital plate and genitalia (dorsal); F, Tegmen; G, Hind wing.

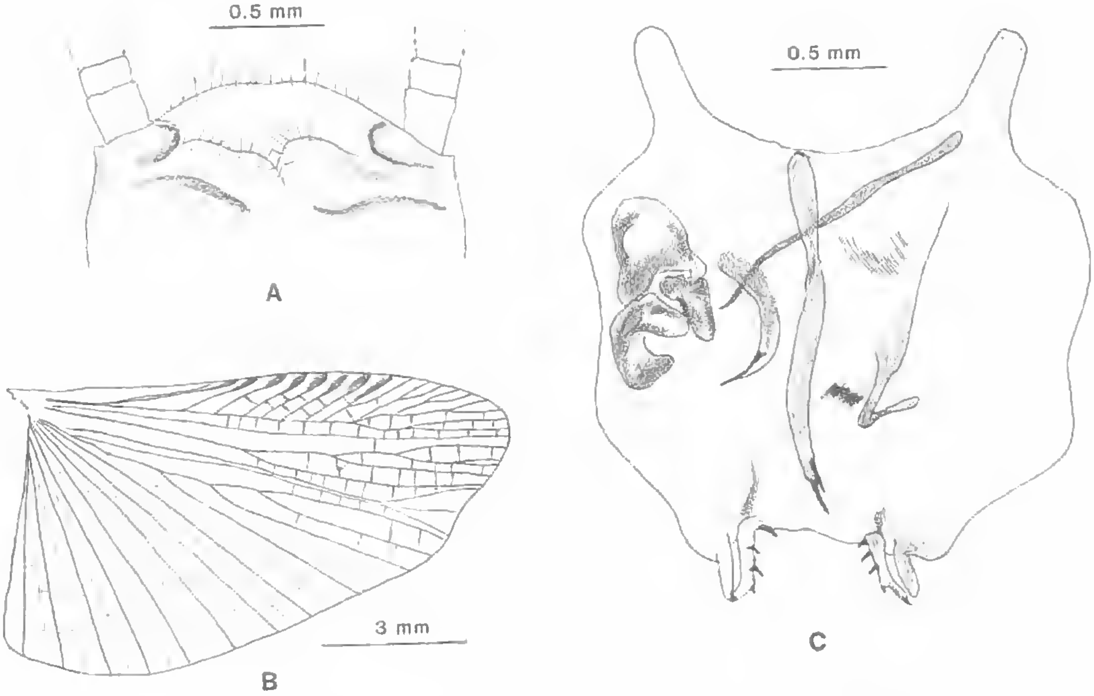

FIG. 9. *Shelfordina panamae* (Hebard), ♂ paratype from Rio Trinidad, Panama: A, Supraanal plate and paraprocts (ventral); B, Hind wing; C, Subgenital plate and genitalia (dorsal).

beyond end of abdomen, discoidal sectors of former longitudinal (Fig. 8F). Hind wing with unbranched costal veins slightly thickened on distal halves, discoidal, median, and cubitus veins almost straight, latter with 3-4 complete and 0 incomplete rami, apical triangle distinct (Fig. 8G). Front femur Type A_3; pulvilli present on 4 proximal tarsomeres, tarsal claws with subobsolete teeth on ventral margins, arolia present. Abdominal terga unspecialised. Supraanal plate strongly transverse, hind margin convex, reaching hind margin of subgenital plate, right and left paraprocts similar (Fig. 8C). Subgenital plate with exposed portion symmetrical, styles widely separated arising from posterolateral corners of plate, each with slightly shorter accessory style near base, interstylar margin straight, upturned, unmodified (Fig. 8E); ventrally, anterior to base of each accessory style, a small mound bearing group of small dark setae (Fig. 8D). Genitalia as in Fig. 8E: hook on right side with small apical spine; median phallomere, slender, rodlike, apex unmodified.

Colouration. Head reddish brown, labral and clypeal regions pale, face with light areas near each antennal socket and on frons (Fig. 8A). Pronotum with disk deep reddish brown, oblique margins of macula yellow, lateral regions semihyaline, posterior area very dark brown or blackish (Fig. 8B). Tegmina reddish brown, yellow spot near base of axillary vein (Fig. 8F). Hind wing with subcostal and thickened costal vein areas pale, region posterior to thickened veins up to discoidal vein weakly infuscated, darkened region extending to apical margin, small area behind apical triangle weakly infuscated. Abdominal terga light brown, lateral borders infuscated, supraanal plate with pale longitudinal macula medially. Abdominal sterna reddish brown, upturned interstylar region pale. Legs reddish brown. Cerci dark brown dorsally and ventrally, preapical segment pale.

Female. Unknown.

Measurements. Length, 10.0-11.5; pronotum length x width, 3.0 x 4.0-4.2; tegmen length, 12.5-13.6.

Shelfordina panamae (Hebard) n.comb.
(Figs 9A-C)

Neoblattella panamae Hebard, 1920, p.56, pl. 3, fig. 12 (♂ and ♀).

Imblattella panamae (Hebard): Princis, 1969, p.796.

HOLOTYPE (not examined)
♂, Rio Trinidad, Panama, 19.iii.1912, A. Busck; in United States National Museum.

MATERIAL EXAMINED

PARATYPE. ANSP: same locality as holotype, ♂ (terminalia slide 409), 7.x.1911, A. Busck.

DESCRIPTION

Male. Interocular space slightly less than distance between antennal sockets. Pronotum with anterior and posterior margins truncate, latter broader, lateral margins convex. Tegmina and wings fully developed, discoidal sectors of former, longitudinal. Hind wing with most costal veins distinctly clubbed, discoidal, median and cubitus veins straight, latter with 3-4 complete and 0 incomplete branches, apical triangle small (Fig. 9B). Front femur Type A$_3$ (first terminal spine may be only slightly longer than one preceding it); pulvilli present on 4 proximal tarsomeres, tarsal claws with flange on inner margins and with 2 or 3 distinct but microscopic teeth distad. Abdominal terga unspecialised. Supraanal plate transverse, hind margin convex, right and left paraprocts similar, simple plates (Fig. 9A). Subgenital plate almost symmetrical; styles similar, widely spaced, adjacent to each style basally, an accessory style about as long as styles, with 3 or 4 dark spines on inner margins; interstylar margin almost straight (Fig. 9C). Genitalia as in Fig. 9C: hook on right side without a terminal spine or subapical incision; median phallomere with apical and preapical spines.

Colouration. General colour brown. Head with subobsolete broad brown interocular band. Pronotal disk brown with dark lines and blotches. Tegmina light brown, hyaline. Hind wing weakly infuscated, axillary vein area lighter (Fig. 9B).

Measurements. (Hebard's measurements in parentheses). Length, 9.6 (10.0-11.5); pronotum length x width, 2.4 x 3.4 (2.5- 2.7 x 3.6), tegmen length, 10.6 (11.1-11.8).

Shelfordina philippinensis n. sp.
(Figs 10A-J)

MATERIAL EXAMINED

HOLOTYPE: ♂ (terminalia slide 470), Camarines Sur Prov., Mt Iriga, Luzon Island, Philippines, 500-600m, light trap, 3-4.iv.1962, H.M. Torrevillas; in BPBM.
PARATYPES. PHILIPPINE ISLANDS. BPBM: Negros Or., Mt Talinas, 900-1200m, rain forest, 1♀, 9.vi.1958, H. E. Milliron, Luzon, Mt Prov., Ifugao Mayoyao, 1000-1500m, 1♀, 29.vi.1966, H. M. Torrevillas.

DESCRIPTION

Male. Eyes close together, interocular distance distinctly less than space between ocellar spots and antennal sockets (Fig. 10C). Pronotum subelliptical (Fig. 10A). Tegmina and wings fully developed extending well beyond end of abdomen. Tegmina with discoidal sectors longitudinal (Fig. 10E). Hind wing with subcosta and unbranched costal veins clubbed, discoidal and median veins straight, simple; cubitus vein practically straight with 2 or 3 complete and 0 incomplete branches, apical triangle well developed (Fig. 10F). Front femur Type A$_2$; pulvilli present on 4 proximal tarsomeres, tarsal claws symmetrical, ventral margins distinctly toothed, arolia present. Abdominal terga unspecialised. Supraanal plate transverse, hind margin convexly rounded; right and left paraprocts, similar simple plates (Fig. 10B). Subgenital plate symmetrical, styles widely separated, accessory styles present, similar, interstylar margin convexly rounded (Fig. 10D). Genitalia as in Fig. 10D: hook on right side, hook portion short, apically rounded with a small preapical spine; distal end of median phallomere obliquely bent, with preapical setose modification.

Colouration. Yellowish brown. Head yellowish with vertex brown becoming lighter on occiput, transverse brown bands between ocellar spots and antennal sockets (Fig. 10C). Pronotum with symmetrical pattern of dark maculae, lateral regions hyaline (Fig. 10A). Tegmina pale hyaline, mediastine vein weakly darkened for part of its length. Hind wing with clubbed region of costal veins dark, remainder with yellowish tinge (Fig. 10F). Abdominal terga yellowish brown. Abdominal sterna yellowish brown, basal half of subgenital plate with pair of large brownish black maculae on distal half of segment. Legs yellowish brown.

Female. Interocular space about same as interocellar distance greater than space between antennal sockets. Tegmina reduced (Figs 10G,I), reaching to about T7; hind wings shorter than tegmina, cubitus vein with 1 or no complete branches, apical triangle absent (Figs 10H,J). Supraanal plate with hind margin convexly rounded (as in ♂, Fig. 10B). Head and pronotal markings less intense than in male. Tegmina with mediastine vein weakly darkened, anal vein pale

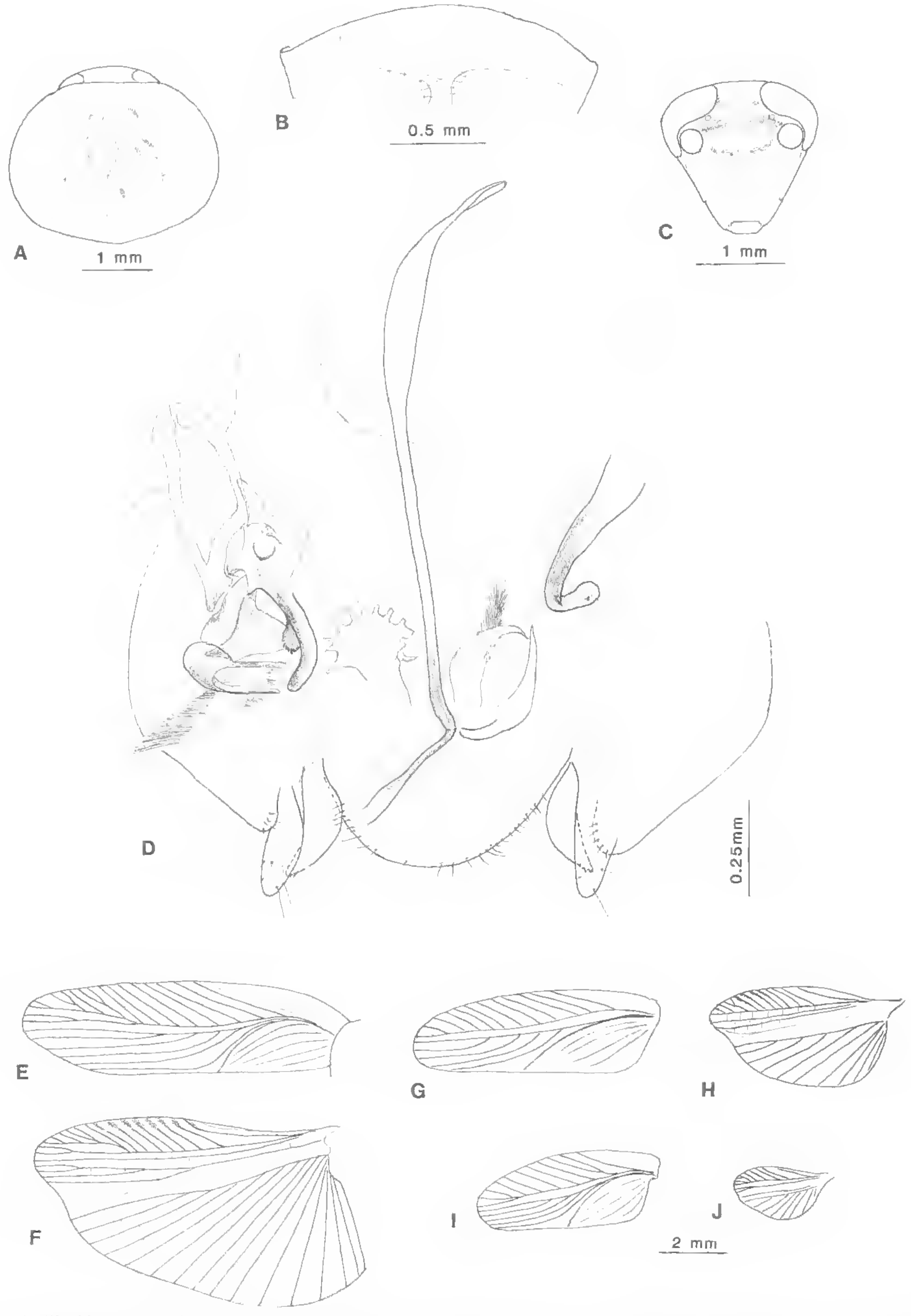

FIG. 10. *Shelfordina philippinensis* n.sp. A-F, ♂ holotype: A, Pronotum; B, Supraanal plate and paraprocts (ventral); C, Head; D, Subgenital plate and genitalia (dorsal); E,F, Tegmen and wing. G-J, ♀ paratypes, tegmina and wings: G,H, From Mt Talinas, Negros Or.;.I,J, From Ifugao, Mayoyao, Luzon. All tegmina and wings to same scale.

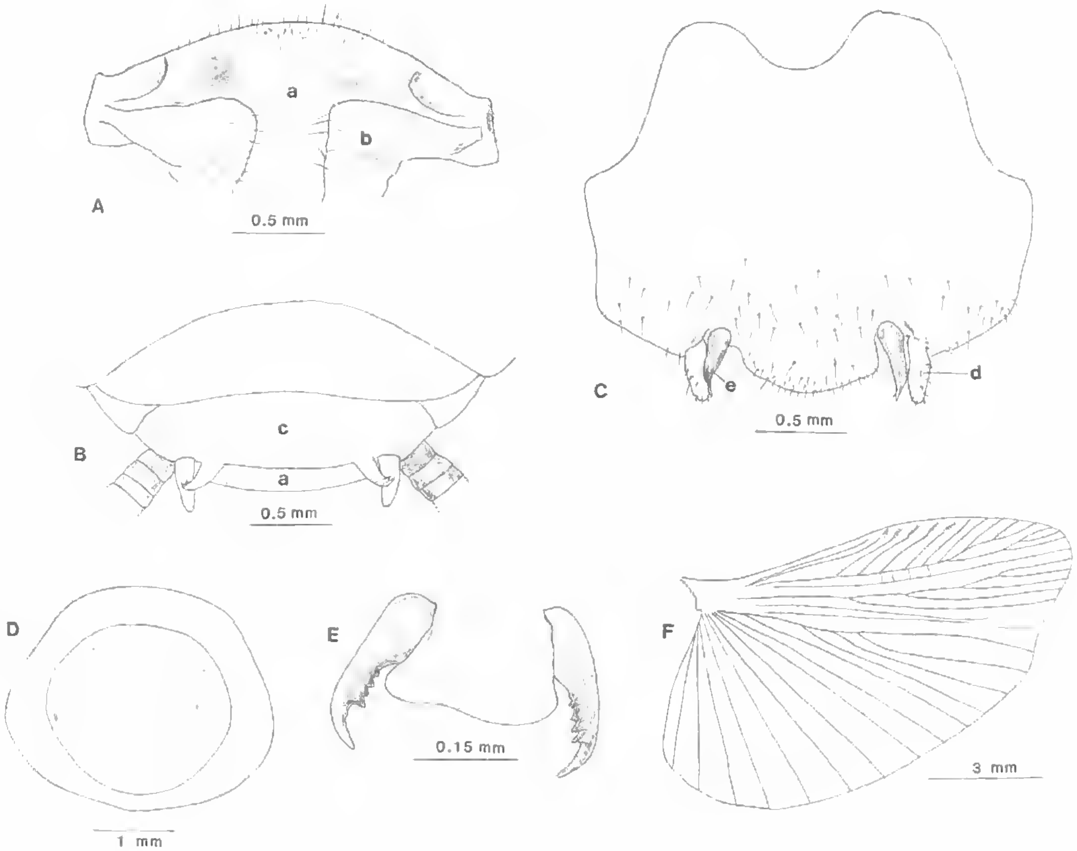

FIG. 11. *Shelfordina orchidae* (Asahina), ♂ from Black Mt., ACT., Australia: A, Supraanal plate and paraprocts (ventral); B, Terminal abdominal segments (ventral); C, Subgenital plate (dorsal); D, Pronotum; E, tarsal claws and arolium; F, Hind wing. Abbreviations: a, supraanal plate; b, right paraproct; c, subgenital plate; d, style; e, accessory style.

or weakly darkened. Abdominal terga and sterna reddish brown, with interspersed light areas.

Measurements. (♀ in parentheses). Length, 8.7 (7.7-9.6); pronotum length x width, 2.3 x 3.0 (2.3-2.6 x 3.1-3.5); tegmen length, 9.5 (5.6-6.7).

REMARKS

This is the first record of the genus in the Philippines.

Shelfordina orchidae (Asahina) n. comb.
(Figs 11A-F,12A-D,13A- B,29)

Imblattella panamae (*nec* Hebard), Asahina, 1973, p.126, figs 9-12, 19-22; Rentz, 1987b, p.3, figs 1-8.
Imblattella orchidae Asahina, 1985, p.6, figs 9-18, 20, 21, 23, 24(♂ and ♀); Rentz, 1987a, p.44, figs 1-8; 1987c, p.14, figs.1-8.

MATERIAL EXAMINED

JAPAN. ANIC: 1♂ (terminalia slide 181), paratype of *Imblattella orchidae* Asahina, Totsuka, 5.ii.1973, S. Asahina.

AUSTRALIAN CAPITAL TERRITORY. ANIC: Canberra (Spence), 1♂, 1 nymph, 25.ix.1987, J. and S. Rickard. The following were collected by D.C.F. Rentz: Black Mt., 35.17S 149.06E, Botanical Gardens, in orchids or orchid house, 1♂, 3♀♀ (1 carrying ootheca; 1 genitalia slide 176), reared from nymphs, 27.iii.1986, 1♂ (terminalia slide 175), 24.xi.1986, 1♀ 22.vii.1985 (coll. as nymph, matured 10.x.1985), 1♀. 27.iii.1986 (coll. as nymph, matured 4.vi.1986), 1♀, 23.vii.1985

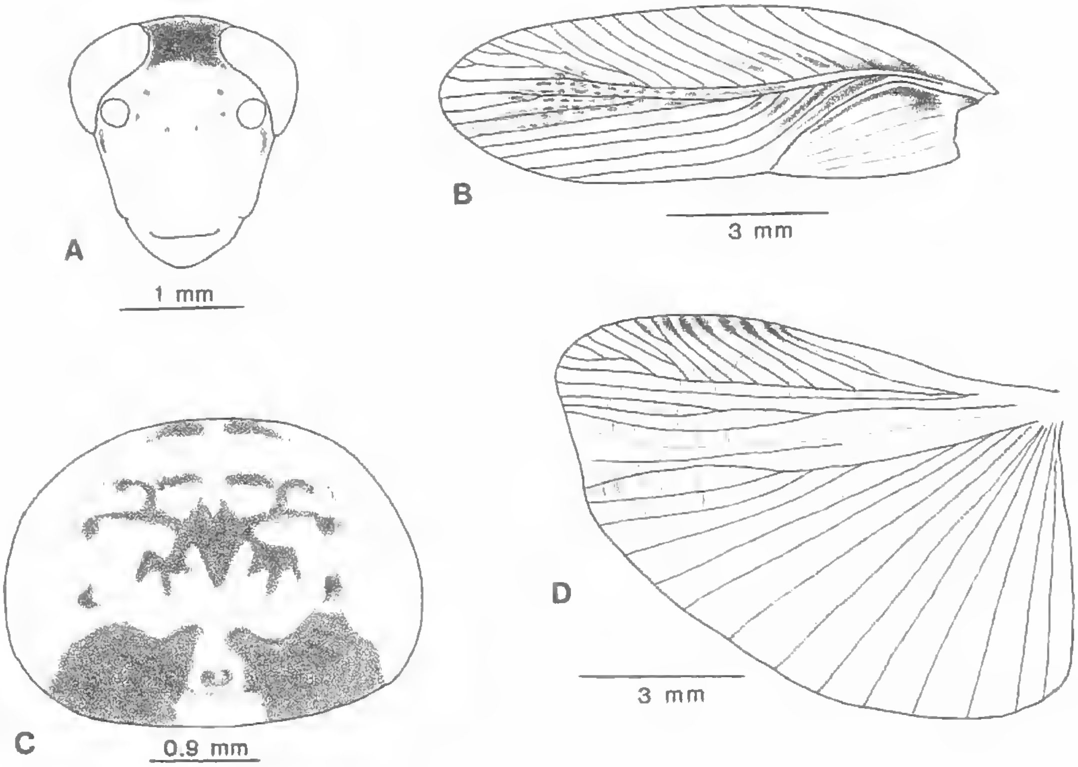

FIG. 12. *Shelfordina orchidae* (Asahina), ♀ from Lake Barrine, Qld: A, Head; B, Tegmen; C, Pronotum; D, Hind wing.

(coll. as nymph, matured, 17.ix.1985), 1♀, 10.iii.1987; Canberra (Farrar), 35.22S 149.05E, 2♂♂, 5.ii.1987, 1♂, 12.i.1987.

NEW SOUTH WALES. DARA: Hamilton, 2♂♂, 5♀♀, 'eating orchid leaves', 23.ii.1955.

QUEENSLAND. ANIC: Pialba (orchid nursery), x.1988, G. Cook (pers. comm. D. Rentz); Dunk Island, 1♀, 8.viii.1950, R. Dobson, QMBA: Lake Barrine, Atherton Tableland, 17.15S 145.38E, rainforest, by torch, 1♀, 7.xii.1950, J. Balderson; Curtain Fig. 2km SSW of Yungaburra, Atherton Tableland, 17.17S 145.34E, 1♀, 14.xii.1985, J. Balderson.

DESCRIPTION

Male. Interocular space distinctly less than distance between antennal sockets (Fig. 12A). Pronotum suboval (Fig. 11D). Tegmina and wings fully developed, discoidal sectors of former sublongitudinal (Fig. 12B). Hind wing with proximal costal veins clubbed, discoidal, median, and cubitus veins straight, latter with 2-4 complete and 0 incomplete branches, apical triangle small (Figs 11F,12D). Front femur Type A_3; pulvilli present on 4 proximal tarsomeres, tarsal claws symmetrical, ventral margins distinctly serrated, arolia present (Fig. 11E). Abdominal terga unspecialised. Supraanal plate transverse, hind margin convexly rounded, paraprocts similar, plates partially sclerotised (Fig. 11A). Subgenital plate symmetrical, styles short, cylindrical, apically rounded, located in posterolateral corners of plate, each with short contiguous, articulated accessory style terminating in pair of minute spines (Fig. 11B); between styles and accessory styles an upturned (in pinned specimens) plate (seen flattened in Fig. 11C). Genitalia as in Fig. 13B: hook small, on right side with small apical spine; apex of median phallomere terminating in pair of spinelike processes; accessory median phallomere with several large terminal setae; beneath median and accessory median phallomeres, a densely setose wrinkled membrane (this and dark brushlike structure visible through transparent subgenital plate); left phallomere much larger than right genital hook and is drawn further to the left of its

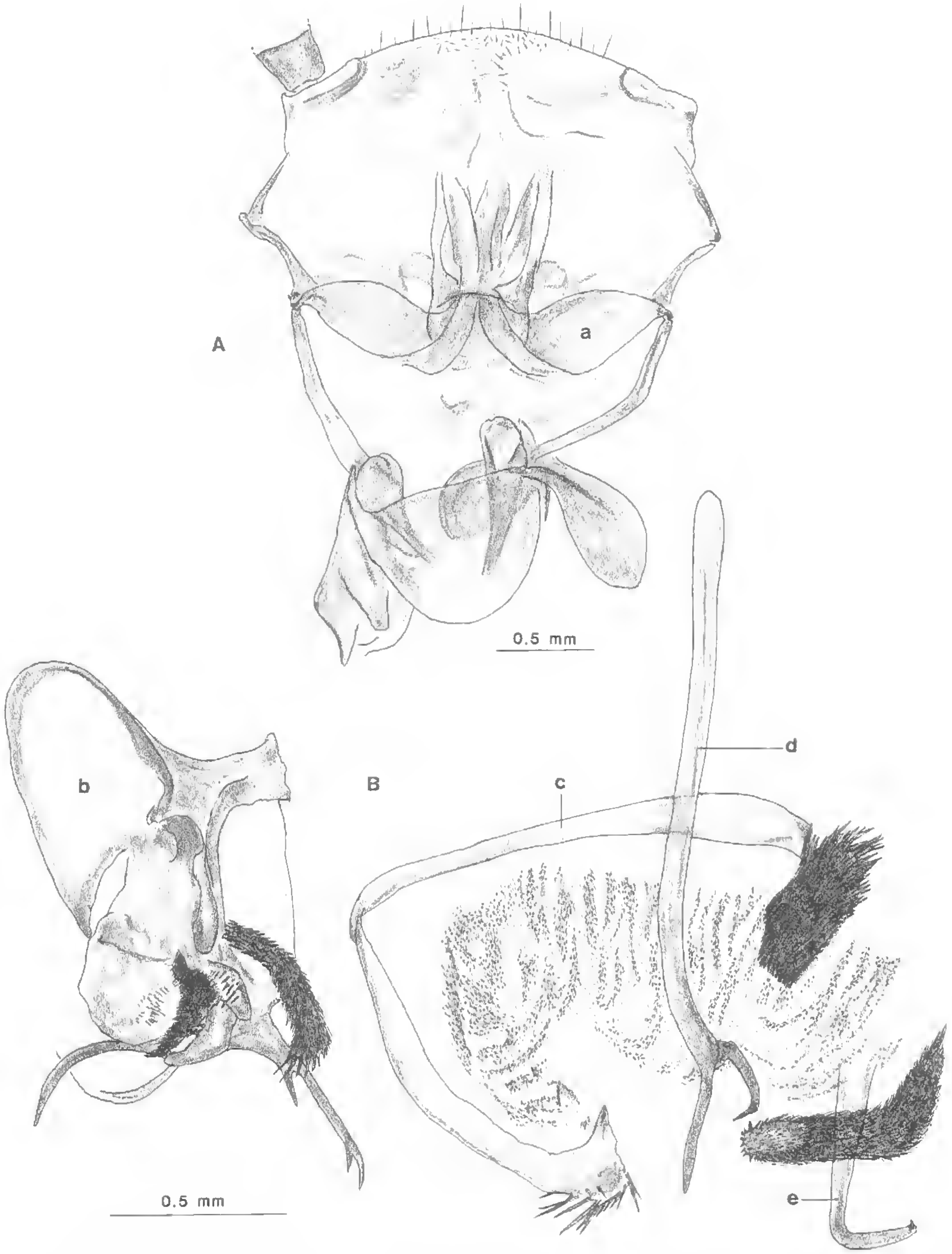

FIG. 13. *Shelfordina orchidae* (Asahina). from Black Mt., ACT., Australia: A, ♀, genitalia (ventral); B, ♂, genitalia (dorsal). Abbreviations: a, first valvifer; b, left phallomere; c, accessory median phallomere; d, median phallomere; e, hooklike right phallomere.

normal position in order to show left side of accessory median phallomere

Colouration. Head with occiput yellowish brown, broad brownish band on vertex, face very pale, immaculate (Fig. 12A). Pronotum hyaline, including disk which has symmetrical brown markings (Fig.11D). Tegmina transparent, very light brown, with some small dark brown spots basally along mediastinal and anal veins. Hind wings pale, translucent, veins dark. Abdominal terga very pale, translucent, narrowly suffused with brown along lateral margins, supraanal plate with pair of dark maculae near hind margin. Abdominal sterna pale, brownish dot and suffusion near lateral borders. Cerci yellowish, basal segments, apex, and couple of preapical segments dark brown and separated from tip by pale segment.

Female. Supraanal plate transverse, hind margin convex (Fig. 13A) not reaching hind margin of subgenital plate. Colouration as in male but a female from Lake Barrine, Queensland, has very dark markings on pronotum (Fig. 12C) and maculae on tegmina are more extensive (Fig. 12B). Subgenital plate has pair of dark spots or single large macula near hind margin. Genitalia as in Fig. 13A; base of first valvifer greatly enlarged, femur-shaped. The ootheca is illustrated in Asahina (1985, Fig. 21).

Nymph. The nymph is illustrated in Asahina (1973, fig.21; 1985, fig. 20) (these were also reproduced by Rentz (1987a-e).

Measurements (♀ in parentheses). Length, 8.6- 10.8 (9.6-11.0); pronotum length x width, 2.4-2.7 x 3.2-3.7 (2.5- 2.9 x 3.4-3.8); tegmen length, 10.4-11.8 (9.5-10.5).

REMARKS

This species apparently is well established in Australia. The earliest specimens were collected in 1955 in Hamilton, New South Wales., feeding on orchid leaves. Although most of the specimens were taken associated with orchids (including the type specimens from Japan), the species has been collected outside of greenhouses. Dr Asahina confirmed my determination of the Australian specimens.

According to Rentz (1987a-e), *Shelfordina orchidae* is nocturnal, lives among roots of epiphytic orchids, and may feed on the growing root tips and damage flower buds and developing shoots of vegetative parts of the plants. They also live amongst pinebark and other planting material used in pot grown orchids. Oothecae are secured to tangles of roots. The insects hide among the roots or planting media and emerge and feed at night. Lepschi (1989) determined that *orchidae* is predominantly herbivorous, feeding on a variety of plant material including pollen, fungal hyphae and plant tissue. It has been collected on ferns and apparently is not restricted to feeding on orchids.

Shelfordina tozerensis n.sp.

(Figs 14A-E, 15A-C, 29)

MATERIAL EXAMINED

HOLOTYPE ♂, 9km ENE of Mt Tozer, Iron Range Nat. Park, 12.43S 143.17E, mixed low open forest, 10.xii.1986, D.C.F. Rentz; in ANIC.

PARATYPES: QUEENSLAND. QMBA: Bellenden Ker Range, 1/2km S. Cable Tower No. 7, 500m, 2♂♂ (1 with missing abdomen), 2♀♀, 17-24.x.1981, Earthwatch/Qld Mus.; Iron Range, NQ, 1♂ (pyrethrum knockdown/RF), 1♂, 1♀, 50m, in rainforest, 3-10.xii.1985, G. Monteith and D. Cook; Iron Range, Cape York Pen., NQ, 1♀, 30.vi.-4.vii.1977, G.B. Monteith. ANIC. 6km ENE of Mt Tozer, 12.44S 143.16E, 1♀, 30.vi.1986, T. Weir and A. Calder. The following were collected by D.C.F. Rentz, in or near Iron Range National Park: 2km NE by E of Mt Tozer, 12.44S 143.13E, 1♂, 1♀, 1.vii.1986; 3km ENE of Mt Tozer, 12.44S 143.14E, rainforest margin 1♂ (terminalia slide 183); 3♀♀ (1 with ootheca; 1 with terminalia slide 184), 28.vi.-4.vii.1986, [1♀, same data ex pan trap, J.C. Cardale]; 8km E by N of Mt Tozer, 12.44S 143.17E, 1♂, 1♀, rainforest, 7.vii.1986, same data as holotype, 2♂♂ (1 with terminalia slide 180), 1♀, 1 nymph, 10.vii.1986; 11km ENE of Mt Tozer, 12.43S 143.18E, rainforest margin, 1♂, 1♀, 1♀ (at light), 11.vii.1986.

DESCRIPTION

Male. Eyes very close together, interocular space less than length of first antennal segment (Fig. 14B). Pronotum suboval (Fig. 14A). Tegmina and wings fully developed extending beyond end of abdomen. Hind wing with subcosta and 5 or 6 costal veins clubbed, discoidal and median veins straight, simple, cubitus vein straight with 3-4 complete and no incomplete branches, apical triangle small (Fig. 14D). Front femur Type A_2, or A_3 (first terminal spine only slightly longer than preceding ones), pulvilli present on 4 proximal tarsomeres, tarsal claws minutely serrated, arolia present. Abdominal terga unspecialised. Supraanal plate transverse, hind margin convexly rounded, reaching to about hind margin of subgenital plate, right and left

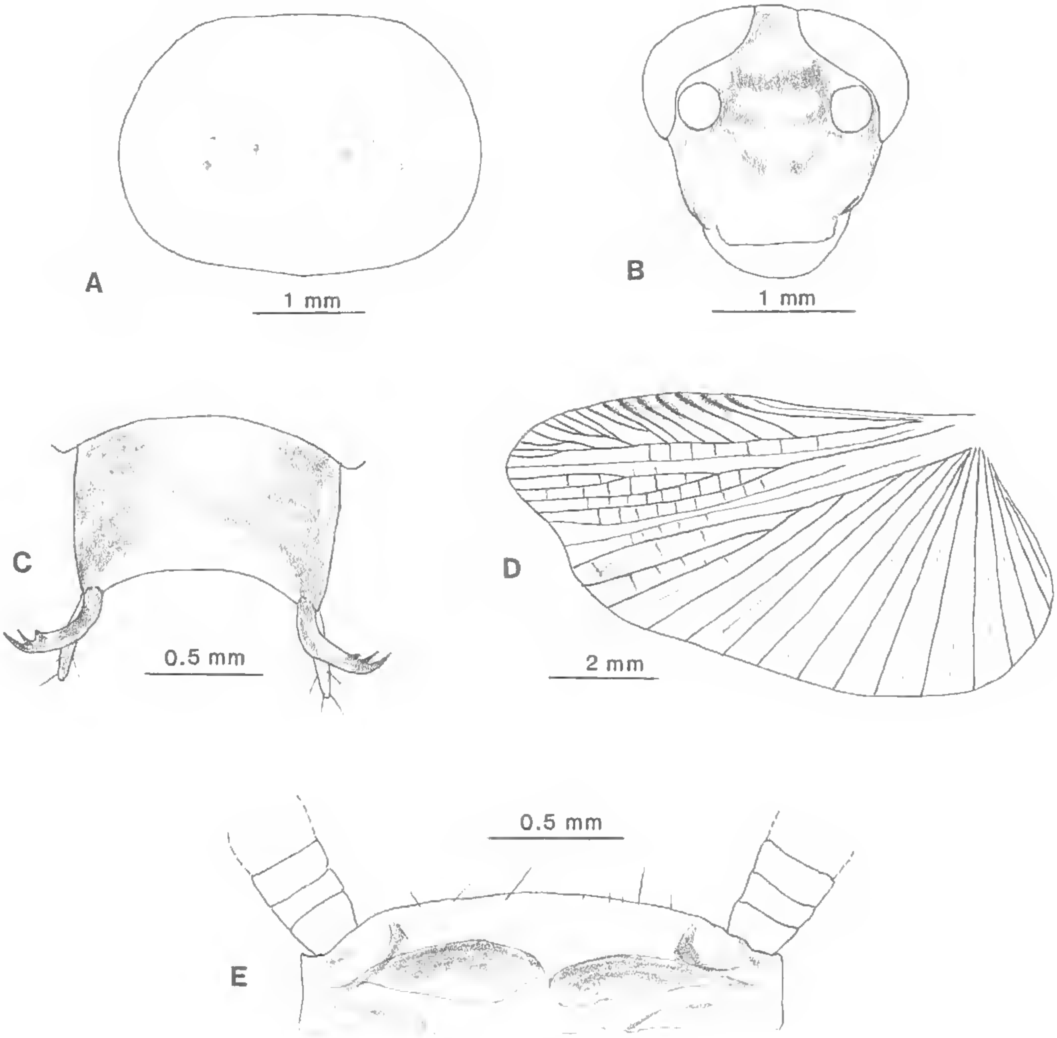

FIG. 14. *Shelfordina tozerensis* n.sp., ♂ paratypes from near Mt Tozer, Qld, Australia: A, Pronotum; B, Head; C, Subgenital plate (ventral); D, Hind wing; E, Supraanal plate and paraprocts (ventral).

paraprocts similar, simple plates (Fig. 14E). Subgenital plate symmetrical, styles similar, cylindrical located in posterolateral corners, each with an accessory style terminating with one or 2 small spines, arising ventrally on the plate (Fig. 14C, 15A); styles and accessory styles extend beyond supraanal plate and are visible in dorsal view; interstylar margin straight or weakly curved, generally reflexed dorsad. Genitalia as in Fig. 15A; hook on right side; median phallomere strongly curved distally.

Colouration. Head with occiput and vertex dark brown, dark brown interocellar band, narrow concave band between antennal sockets, more narrow maculae on frons (Fig. 14B). Pronotal disk with brown markings, lateral and posterior borders hyaline or semihyaline (Fig. 14A). Tegmina light brown, hyaline, basal part of humeral and anal veins darkly infuscated. Hind wing dark, not uniformly infuscated, anterior field lighter than posterior field, its apical region yellowish, region of axillary veins near apical triangle darker than rest of posterior field (amount of infuscation varies with some

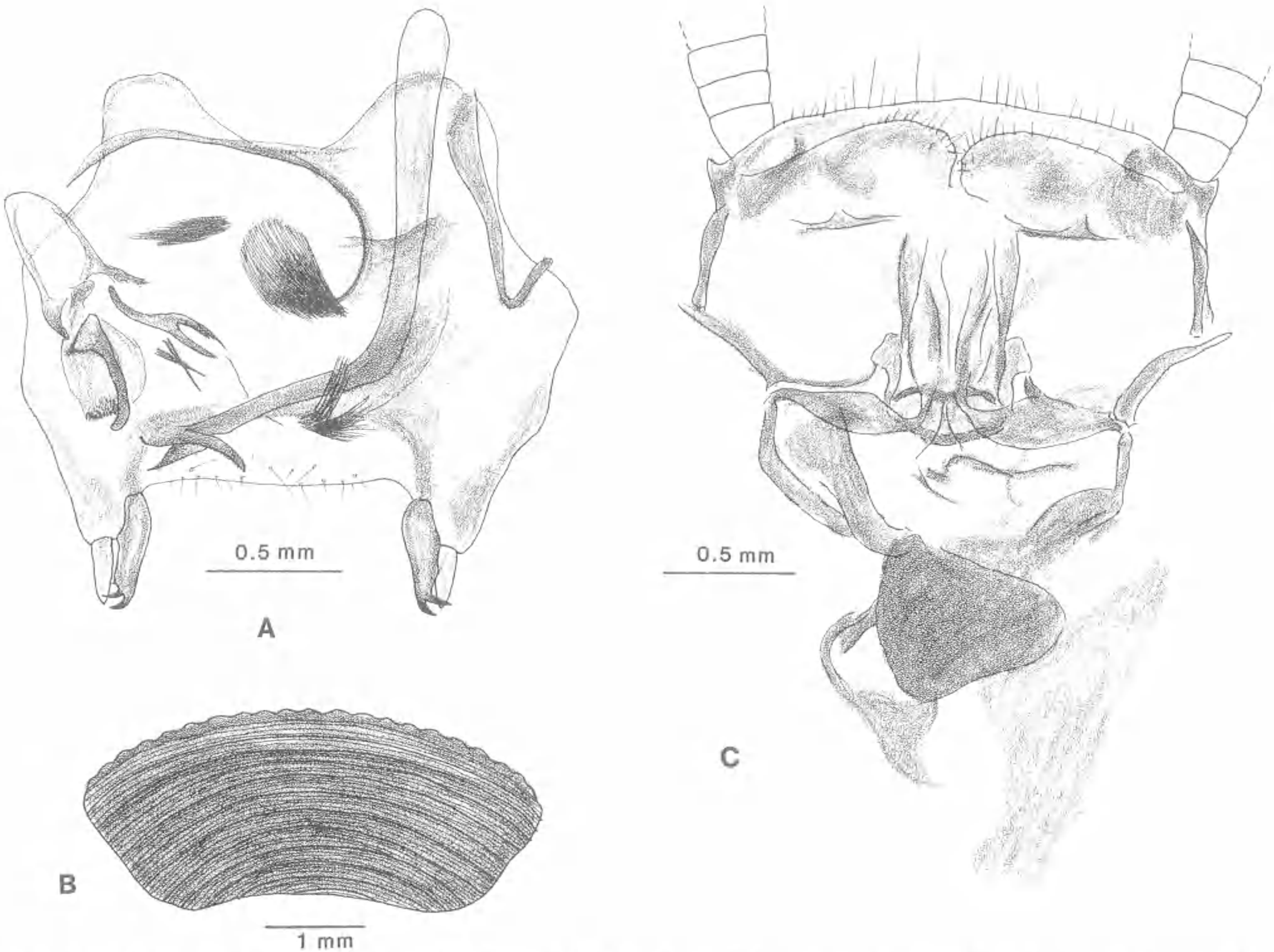

FIG. 15. *Shelfordina tozerensis* n.sp., paratypes from near Mt Tozer, Qld: A, ♂, subgenital plate and genitalia (dorsal); B, Ootheca; C, ♀, genitalia (ventral).

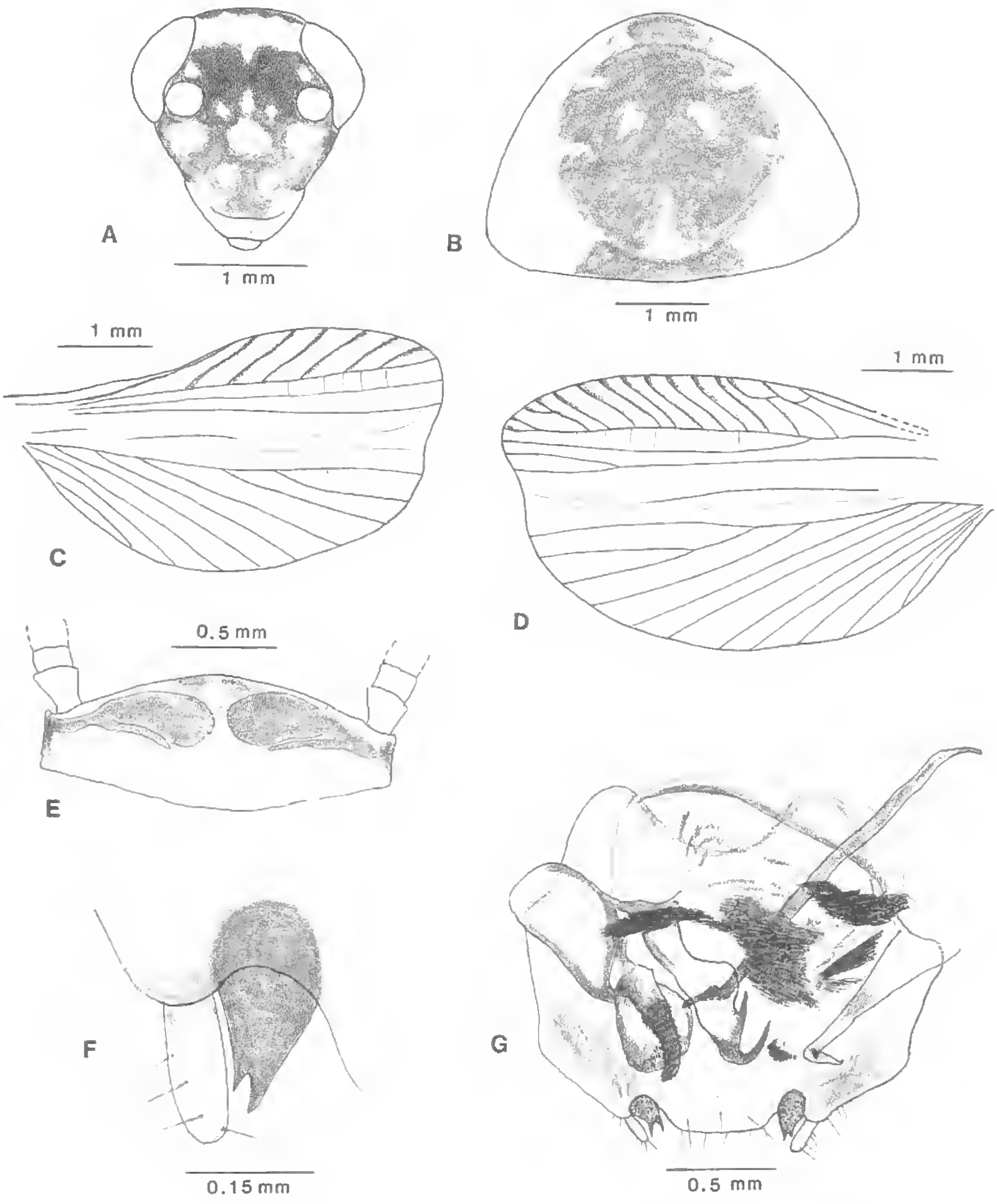

FIG. 16. *Shelfordina cooki* n.sp., ♂♂. A,C,E- G, paratype; B,D, holotype: A, Head; B, Pronotum; C,D, Hind wings; E, Supraanal plate and paraprocts (ventral); F, Right corner of subgenital plate showing style and accessory style (ventral); F, subgenital plate and genitalia (dorsal).

specimens much paler than others) (Fig. 14D). Abdominal terga light brown, terminal segments darker. Abdominal sterna light brown medially, darker laterally, pale spots near each border. Cerci dorsally pale with blackish basal and preapical segments, ventrally mostly brown.

Female. Interocular space about same as length of first antennal segment. Supraanal plate strongly transverse, subrectangular, corners rounded, (Fig. 15C), hind margin not reaching hind margin of subgenital plate. Subgenital plate convex, produced, sides obliquely concave, apex rounded. Genitalia as in Fig. 15C. Abdominal sterna pale with narrow dark brown lateral borders and small prelateral round dots.

Ootheca. Brownish black, keel shallowly undulate with 21 small apically rounded teeth, with about 12 transverse, curved heavy ridges, finer ridges between them, longitudinal cell divisions absent. Length, 4.4 mm, height, 1.8 mm (Fig. 15B).

Measurements (♀ in parentheses). Length, 8.7- 9.3 (8.7-10.3); pronotum length x width, 2.2-2.3 x 3.0-3.3 (2.2- 2.4 x 3.1-3.3); tegmen length, 9.9-10.3 (9.8-10.3).

Shellordina cooki n.sp.
(Figs 16A-G, 29)

Material Examined

Holotype: ♂, Upper Boulder Ck, 11km NNW of Tully, NQ, 850m, 16-19.xi.1984, Cook, Monteith, and Thompson; in QMBA (Reg. No. T11280).

Paratypes: Queensland. QMBA: same data as holotype, 1♂ (terminalia slide 64); Mt Bartle Frere, NQ, NW/Centre Peak ridge, 1400-1500m, 1♂ (abdomen missing), 7-8.xi.1981.

Etymology

The species is dedicated to Mr D.J. Cook who has participated in many Queensland Museum collecting trips (Monteith, pers. comm.)

Description

Male. Head slightly protruding beyond prothorax; interocular space about same as distance between antennal sockets (Fig. 16A). Pronotum subparabolic (Fig. 16B). Tegmina slightly reduced reaching end of or slightly beyond end of abdomen. Hind wings smaller, costal veins weakly thickened, their number variable, fewer in more reduced wings; discoidal and median veins simple, straight, latter may arise from and look like branch of former, cubitus vein straight, simple or with 1 complete and no incomplete branches, apical triangle essentially absent (Figs 16C,D). Front femur Type A$_3$, first of 3 terminal spines may be only slightly longer than preceding spines which may include couple of piliform spinules; pulvilli on 4 proximal tarsomeres, tarsal claws distinctly serrated, arolia present. Abdominal terga unspecialised. Supraanal plate transverse, hind margin broadly, shallowly convex; paraprocts similar dark plates (Fig. 16E). Subgenital plate convex, symmetrical, distal half reflexed dorsad; styles small, cylindrical, similar, each arising in posterolateral corners of plate; associated with each style, arising from dorsal surface of plate, a bulbous, apically divided accessory style (Figs 16F,G). Genitalia as in Fig. 16G; hook on right side without subapical incision.

Colouration. Head with occiput dark brown, broad pale transverse band on vertex, then a shiny blackish macula between eyes and antennal sockets, dull brownish macula on frons (Fig. 16A; dark markings in holotype are more intense and extensive than in paratype). Pronotal disk dark reddish brown with small yellowish spots, lateral borders yellowish on anterior half, remainder hyaline (Fig. 16B). Tegmina reddish brown, hyaline with suffused dark areas. Anterior abdominal terga brown with dark infuscations, terminal segments dull black. Abdominal sterna mostly blackish brown, distal segments pale medially, subgenital plate dark except for narrow medial zone. Cerci dorsally with segments 1-3, 6, 7 and 10 blackish (segment 7 may be pale), other segments yellowish, ventrally brown. Legs with coxae largely infuscated, femurs with narrow dark brown bands distad on anterior surfaces.

Female. Unknown.

Measurements. Length, 7.2-8.0; pronotum length x width, 2.2-2.5 x 3.4-3.7; tegmen length, 5.6-6.5.

Shellordina yeatesi n.sp.
(Figs 17A-F, 29)

Material Examined

Holotype: ♂ (terminalia slide 63), Thornton Peak via Daintree, NQ, 1100-1300m, 24-27.ix.1984, G.B. and S.R. Monteith; in QMBA (Reg. No. T11187).

Paratypes: Queensland. QMBA: Thornton Peak, 11km NE of Daintree, 1100-1200m, 1♀, 30.x.-1.xi.1983, Monteith, Yeates, and Thompson; Thornton Peak via Daintree, 1000-1300m, 1♀ (with ootheca, genitalia slide 66), 20-22.ix.1981, G. Monteith and D. Cook; Bellenden Ker Range, Cable Tower 3, 1054 m, 1♀ (genitalia slide 67), 25-31.x.1981, Earthwatch/Qld Mus.

Etymology

The species is dedicated to Dr D.K. Yeates who has done survey work in north Queensland (Monteith, pers. comm.).

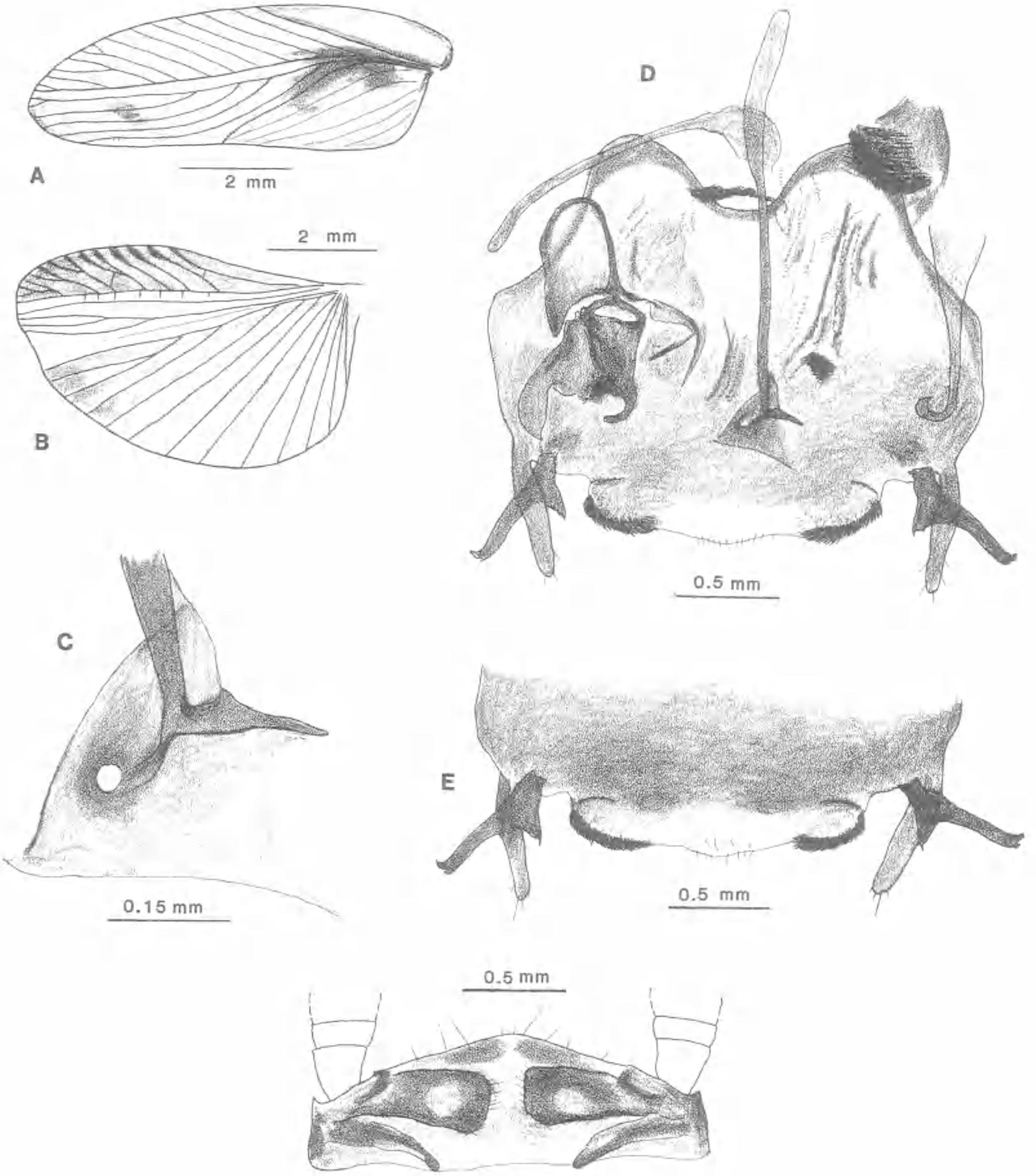

FIG. 17. *Shelfordina yeatesi* n.sp., ♂ holotype: A, Tegmen, B, Hind wing; C, Apex of median genital phallomere (dorsal); D, Subgenital plate and genitalia (dorsal); E, Hind margin of subgenital plate (ventral); F, Supraanal plate and paraprocts (ventral).

DESCRIPTION

Male. Head hidden under pronotum; interocular space less than distance between antennal sockets. Pronotum subparabolic. Tegmina and wings fully developed but reaching only slightly beyond end of abdomen. Hind wing with costal veins distinctly clubbed, discoidal and median veins simple, cubitus vein straight with 2 complete and 0 incomplete branches, apical triangle small (Fig. 17B). Front femur Type A_3 (first terminal spine only slightly longer than preceding ones); pulvilli on 4 proximal tarsomeres, tarsal claws distinctly toothed, arolia present. Abdominal terga unspecialised. Supraanal plate strongly transverse, hind margin shallowly trigonal; right and left paraprocts similar dark plates with pale round central zones (Fig. 17F). Subgenital plate symmetrical with long cylindrical, similar styles in posterolateral corners, below them accessory styles with a small basal branch; interstylar border membranous, upturned, with dense lateral setal brushes (Figs 17D,E). Genitalia as in Fig. 17D: hook on right side, distal region short, curved, without subapical incision; apex of median phallomere modified as in Fig. 17C.

Colouration. Reddish brown. Head with dark brown maculae similar to those of *cooki* (Fig. 16A). Pronotal disk reddish brown with indistinct pale spots. Tegmina reddish brown, hyaline, with large dark basal spot in anal vein region (Fig. 17A). Hind wing with costal vein region (except yellowish apex), and plical fold area darkly infuscated, area between discoidal and cubitus veins unpigmented, posterior field lightly infuscated.

Female. Supraanal plate transverse, hind margin convexly rounded. Cubitus vein of hind wing with 1-2 complete and 0-1 incomplete branches (branching may differ on right and left wings of same female).

Ootheca. Similar to that of *S. tozerensis* (Fig. 15B) except there are fewer heavy longitudinal ridges, most of them being very fine.

Measurements (♀ in parentheses). Length, 8.5 (9.0-9.6); pronotum length x width, 2.5 x 3.9 (2.7 x 3.8-4.1); tegmen length, 7.3 (6.7-7.6).

Shelfordina robertsi n.sp. (Figs 18A-F, 29)

MATERIAL EXAMINED

HOLOTYPE: ♂, Mt Finnigan [15.49S 145.17E], 37km S of Cooktown, NQ, 1100m, Pyrethrum knockdown, 20.xii.1982, L. Roberts; in QMBA (Reg. no. T.11178).

PARATYPES: QUEENSLAND. QMBA: same data as holotype, 2♂♂ (1 with terminalia slide 61), 2♀♀ (1 with genitalia slide 62); same locality and collection method as above, 3♀♀, 850-1100m, 19-22.iv.1982, RF, Monteith, Yeates, and Cook; Mt Finnigan summit via Helenvale, NQ, 1100m, 1♂ (terminalia slide 65), 1♀, 28-30.xi.1985, Monteith, Cook, and Roberts, 1♀, pitfall trap, rainforest, 28-30.xi.1985, G. Monteith and D. Cook.

ETYMOLOGY

The species is dedicated to Mr Lewis Roberts who collected the holotype. He is a self-taught naturalist who lives at the foot of Mt Finnigan and who has guided many biologists to the summit of this remote mountain (Monteith, pers. comm.).

DESCRIPTION

Male. Head almost completely hidden under pronotum; eyes wide apart, the space between them about same as distance between antennal sockets (Fig. 18A). Tegmina and wings reaching only slightly beyond end of abdomen. Hind wing with costal veins clubbed, discoidal and median veins straight, simple, cubitus vein straight with 1-2 complete and 0 incomplete branches, apical triangle small (Fig. 18D). Front femur Type A_3 (first terminal spine only slightly longer than those preceding it); pulvilli present on 4 proximal tarsomeres, tarsal claws distinctly serrated, arolia present. Abdominal terga unspecialised. Supraanal plate transverse, broadly trigonal, apex rounded; paraprocts similar plates, darkly sclerotised around the borders forming a clear, circular, central zone (Fig. 18F). Subgenital plate symmetrical, sides upturned, distal half membranous, reflexed dorsad under supraanal plate; styles similar, cylindrical, non-articulated, located in posterolateral corners of plate, below them large dark accessory styles, the right and left ones weakly dissimilar, interstylar margin trigonal (Figs 18C,E; in pinned specimens interstylar membrane is collapsed and margin appears straight). Genitalia as in Fig. 18C: hook on right side, with small preapical spine; apex of median phallomere modified (Fig. 18B).

Colouration. Brown. Head with pale vertex, occiput darker, large shiny, brown macula extending from between eyes to level of antennal sockets, below this a symmetrical macula (Fig. 18A). Pronotal disk weakly mottled brown. Tegmina hyaline, brown, slightly darker along part of anal vein. Hind wing weakly infuscated, subcostal vein region slightly darker than rest of wing. Abdominal terga light brown, darkly infuscated laterally and on 3 terminal segments. Cerci pale dorsally, segment 6 and apical segment dark. Legs pale, weak distal spots on anterior femoral surfaces.

Female. Supraanal plate transverse, broadly rounded, hind margin entire, not reaching hind margin of subgenital plate. Colour markings may be more intense than in male. Abdominal sterna with large dark brown medial spots, and pair of

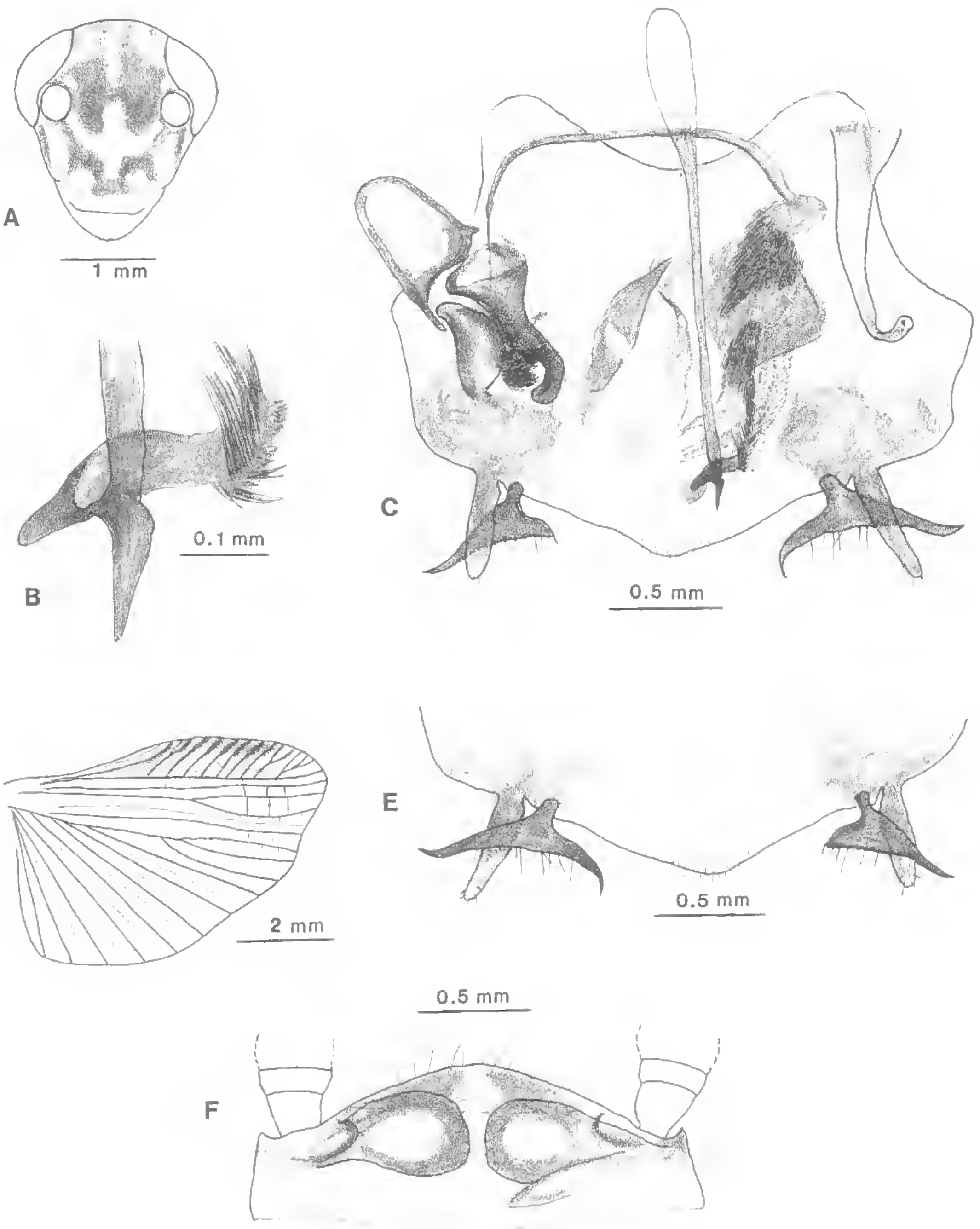

FIG. 18. *Shelfordina robertsi* n.sp., from Mt Finnigan, Qld. D, From holotype, all others from paratypes: A, ♀, head; B-F, ♂♂: B, Apex of median genital phallomere (dorsal); C, Subgenital plate and genitalia (dorsal); D, Hind wing; E, Hind margin of subgenital plate showing styles and accessory styles (ventral); F, Supraanal plate and paraprocts (ventral).

large, narrowly separated maculae in middle of subgenital plate.

Measurements (♀ in parentheses). Length, 7.9- 8.3 (7.9-8.5); pronotum length x width, 2.4- 2.6 x 3.5-3.9 (2.4- 2.7 x 3.6-3.9); tegmen length, 7.0-7.4 (6.5-7.5).

Shelfordina uniformis (Hanitsch) (Figs 19A-G)

Shelfordella uniformis Hanitsch, 1933, p.127, fig.1 (♂).
Ebnerella uniformis (Hanitsch): 1935, p.14.

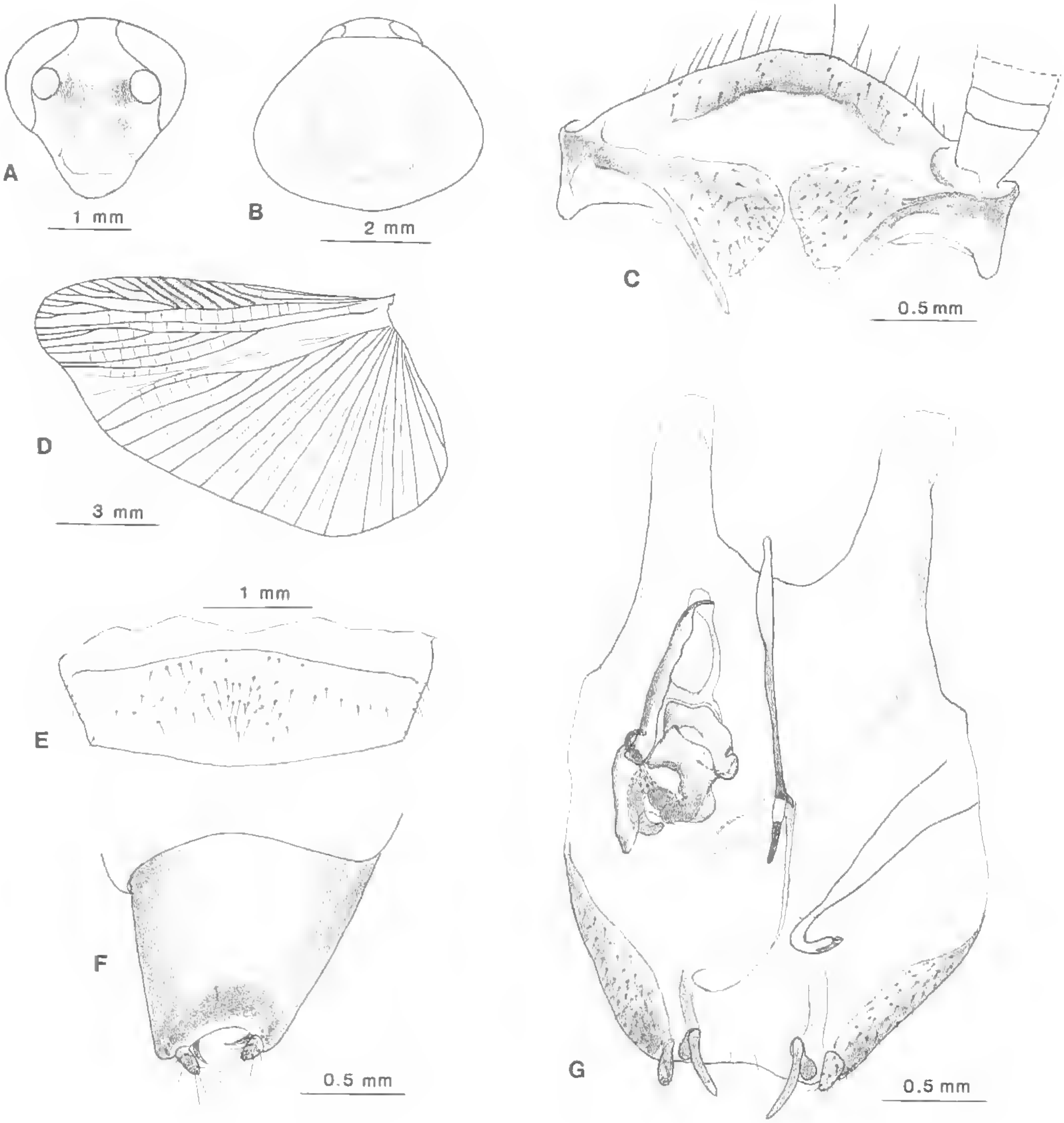

FIG. 19. *Shelfordina uniformis* (Hanitsch), ♂ holotype: A, Head; B, Pronotum; C, Supraanal plate and paraprocts (ventral); D, Hind wing; E, Seventh abdominal tergum; F, subgenital plate (ventral); G, Subgenital plate and genitalia (dorsal).

Possoina uniformis (Hanitsch): Bruijning, 1947, p.218.
Shelfordina uniformis (Hanitsch): Princis, 1969, p.872.

MATERIAL EXAMINED

HOLOTYPE: ♂ (terminalia slide 27), Lake Posso and neighbourhood, Central Celebes, ii.1895, Sarasin (labelled *Shelfordella uniformis* n.gen., n.sp.,♂, R. Hanitsch, 7.vii.1933); in MHNB.

DESCRIPTION

Male. Interocular space distinctly less than distance between antennal sockets (Fig. 19A); fifth palpal segment slightly smaller than fourth. Pronotum subparabolic (Fig. 19B). Tegmina and wings fully developed, former with longitudinal discoidal sectors. Hind wing with unbranched costal veins uniformly thick throughout, not clubbed, discoidal and median veins unbranched, straight, cubitus vein with 5 complete and 0 incomplete branches, apical triangle well developed (Fig. 19D). Front femur Type A_3; 4 proximal tarsomeres with pulvilli, tarsal claws symmetrical, ventral margins minutely toothed, arolia present. Seventh abdominal tergum unspecialised. Eighth abdominal tergum enlarged, surface with spaced setae (Fig. 19E). Ninth tergum completely hidden under T8. Supraanal plate with hind margin thickened, convexly rounded not reaching hind margin of subgenital plate; right and left paraprocts similar darkly sclerotised (in part) setose plates (Fig. 19C). Subgenital plate elongate, sides broadly upturned, distal region reflexed dorsad, concave; small styles flat, located in posterolateral corners, near base of each a large, curved, accessory style, interstylar margin weakly concave (Figs 19F,G). [Hanitsch, 1933, fig. 1, did not show the accessory styles in the illustration of the subgenital plate, nor did he mention them in his description]. Genitalia as in Fig. 19G: hook on right side; distal half of median phallomere modified with a slender filament and a short dark sclerite connected to anterior half by a colourless membrane.

Colouration. Head reddish brown, labrum yellowish brown, facial region darker (Fig. 19A). Pronotum dark reddish brown without markings, region outside disk somewhat hyaline. Tegmina light reddish brown, hyaline. Hind wing lightly infuscated, costal vein region darker (Fig. 19D). Abdominal terga light brown. Abdominal sterna reddish brown, subgenital plate darker. Cerci dark brown. Legs reddish brown.

Female. Unknown.

Measurements. Length, 10.0; pronotum length x width, 3.3 x 4.3; tegmen length, 12.0.

REMARKS

The enlarged and setose eighth abdominal tergum, and the unusual median genital phallomere so similar to these structures in *S. spinistylifera*, clearly show that these two taxa are very closely related (see earlier discussion of species-groups).

Shelfordina spinistylifera (Roth) n.comb.

Symploce spinistylifera Roth, 1985b, p.154, figs 12A-G (♂).

MATERIAL EXAMINED

SABAH. BPBM: Tawau Residency, Kalibakan R., 48km west of Tawau, primary forest,♂ holotype of *Symploce spinistylifera* Roth, 9-18.xi.1958, T.C. Maa (terminalia slide 381; tegmen and wing on 2 slides no. 382).

REMARKS

The subgenital plate and styles of *spinistylifera* are similar to those of *wailimensis*, but the accessory styles are much larger and differ in shape (Roth, 1985b; fig. 12C). The eighth abdominal tergum is greatly enlarged and has well spaced setae (Roth, 1985b; fig. 12G). I stated that this was a specialisation, and if it is, then *spinistylifera* and *uniformis* are the only two species of *Shelfordina* with a tergal gland. In my description of *spinistylifera* I stated that the male's genital hook was on the left side. I re- examined my slide but I had separated the 3 main phallomeres and it was impossible to tell the original position of the hook. However, based on its position in *uniformis* and *wailimensis*, it probably is on the right side.

Because of the similarity of T8 and median genital phallomere, I consider *spinistylifera* and *uniformis* more closely related than the former is to *wailimensis*.

Shelfordina wailimensis n.sp.
(Figs 20A-G)

MATERIAL EXAMINED

HOLOTYPE: ♂ (terminalia slide 234), Wai Lima, Z. Sum.[atra]., Lampongs, xi.xii.1921, Karny and Siebers (no. 221); in HDEO.

DESCRIPTION

Male. Interocular space less than distance between antennal sockets (Fig. 20A); palpal segment 5 slightly smaller than segment 4. Tegmina and wings extending beyond end of abdomen, former with longitudinal discoidal sectors. Hind

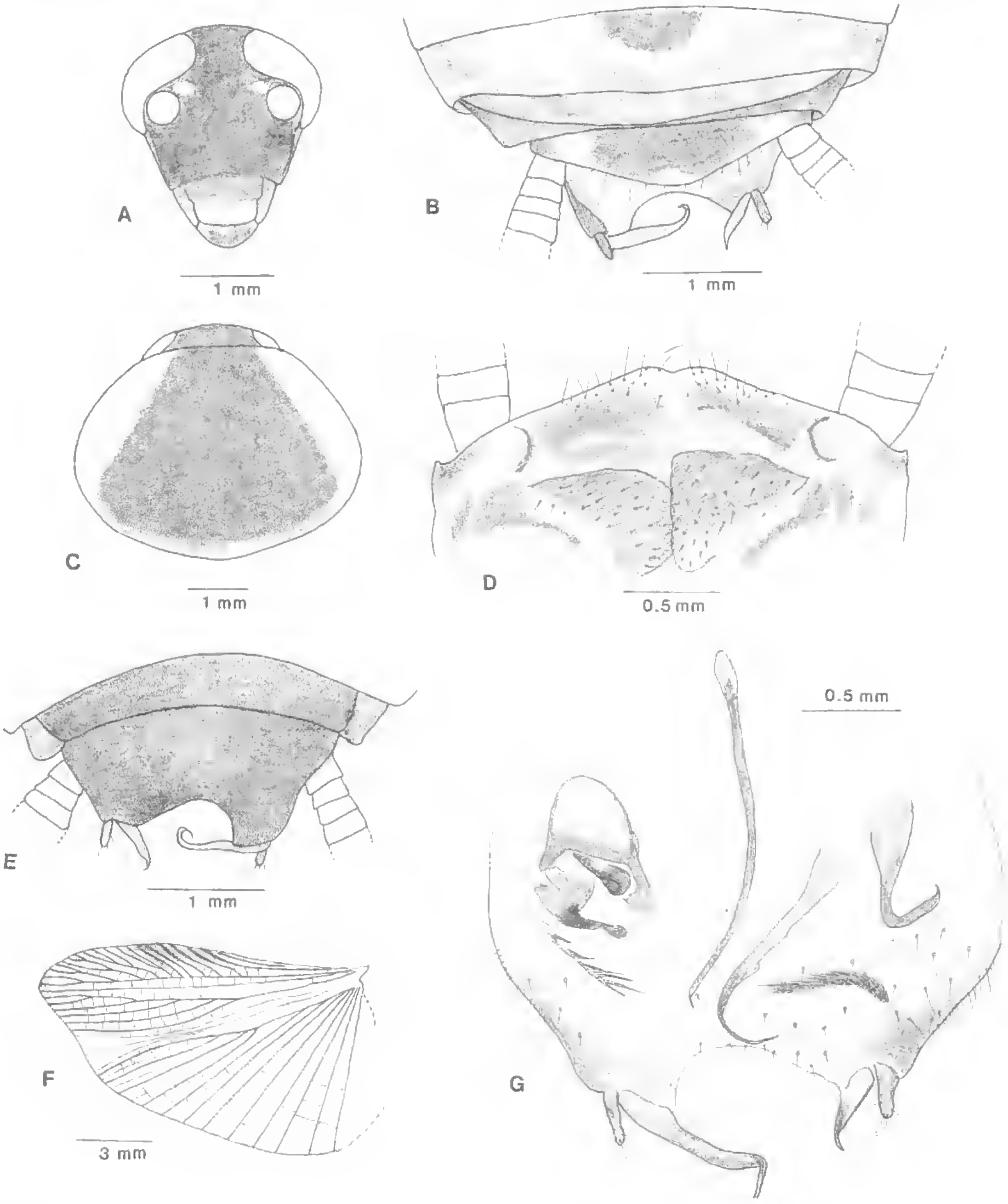

FIG. 20. *Shelfordina wailimensis* n.sp., ♂ holotype: A, Head; B, B, Abdominal terga 7 to 10 (supraanal plate), and subgenital plate (dorsal); C, Pronotum; D, Supraanal plate and paraprocts (ventral); E, Subgenital plate (ventral); F, Hind wing; G, Subgenital plate and genitalia (dorsal).

wing with discoidal and median veins simple, straight; cubitus vein weakly concave with 5 complete and 0 incomplete branches, apical triangle well developed (Fig. 20F). Front femur Type A_3: pulvilli on 4 proximal tarsomeres, tarsal claws symmetrical, ventral margins minutely toothed, arolia present. Abdominal terga unspecialised. Supraanal plate transverse, trigonal, apex weakly indented, paraprocts similar plates (Fig. 20D). Subgenital plate subsymmetrical, styles almost similar, cylindrical, small, each in posterolateral corners of plate; at base of each style a large articulated accessory style, right one only slightly longer than style, left one much larger, apex curved, acute, slender, directed towards right style, interstylar margin concavely excavated (Figs 20B,E,G). Genitalia as in Fig. 20G, hook on right side, apex acute,. without subapical incision; median phallomere, slender, curved, terminating in small, slender, filament; between median and hooklike phallomeres a curved, tapering sclerite.

Colouration. Dark reddish brown. Head dark reddish brown from occiput to clypeus; basal half of clypeus light reddish brown, remainder yellowish brown, labrum light reddish brown (Fig. 20A). Pronotum with large dark reddish brown macula, areas on either side hyaline (Fig. 20C). Tegmina light reddish brown, hyaline, darker along anterior border, marginal field, and basal part of anal field. Abdominal terga 1-5 pale medially, broad lateral zones reddish brown, T6 mostly reddish brown, T7 with dark brown macula surrounded by whitish band anteromedially, laterally with poorly defined yellowish spots on light brownish background (Fig. 20B). Supraanal plate brownish with yellowish spots laterally (near each cercus) and posteromedially (Fig. 20B). Abdominal sterna reddish brown. Cerci reddish brown dorsally, brown ventrally. Legs reddish brown, tarsi pale.

Female. Unknown.

Measurements. Length, 11.5; pronotum length x width, 3.6 x 4.6; tegmen length, 14.0.

Dyakinodes Princis

Dyakinodes Princis, 1951, p.66.

TYPE SPECIES

Ischnoptera centralis Walker = *Dyakinodes victoriae* Princis, by monotypy.

DIAGNOSIS

Small, slender, habitus usually similar to that shown in Fig. 28A. Head exposed, eyes wide apart, sometimes bulging (Figs 22A,C); fifth palpal segment longer than fourth. Tegmina and wings fully developed usually extending beyond end of abdomen. Tegmina with discoidal sectors oblique. Hind wings with discoidal vein simple, straight; median vein straight, usually with basal part convexly curved anteriorly; cubitus vein straight except for concavely curved base, with 1, rarely 2, complete branches near distal part of wing, 3-6 small incomplete branches (some appear like cross veins); a characteristic enlarged 'cell' is formed by the curved bases of the median and cubitus veins (Fig. 26A, arrow), apical triangle absent (Figs 21D, 22F, 25B, 28E). Anteroventral margin of front femur with 1-4 small, stout spines succeeded by row of piliform spinules, terminating in 2 large distal spines (Type B_2; rarely with a third small distal spine), or rarely with piliform spinules only, terminating in 2 large spines (Type C_2); ventral margins of mid and hind femurs sparsely spined (2-4 small spines); pulvilli present on 4 proximal tarsomeres, tarsal claws symmetrical, simple, arolia present. ♂: First abdominal tergum unspecialised. Seventh abdominal tergum with a glandular specialisation (Figs 21B, 22E, 23A,D,G). Supraanal plate symmetrical or almost symmetrical; right and left paraprocts dissimilar (Fig. 26B,b); with or without a structure arising ventrally near base of cercus (subcereal process; Fig. 26B,a). Subgenital plate weakly asymmetrical, styles small, similar (Fig. 26E) or weakly dissimilar (Fig. 22D). Hooklike genital phallomere on left side (Fig. 21E).

REMARKS

Princis (1969, p.994) lists only 1 species, *Dyakinodes centralis*, in the genus. I find 6 new species, described below. The genus is known only from Australia.

The male genital hook on the left side places *Dyakinodes* in the Blattellinae (McKittrick, 1964). However, this should be confirmed by determining if the female rotates the ootheca prior to depositing it (Bohn, 1987).

SPECIES GROUPS OF *DYAKINODES*

Based on males.

1. *kurandensis* species-group: Hind margin of supraanal plate convexly rounded, entire. Subcercereal processes absent. Species: *kurandensis*; *uptoni*.

2. *centralis* species-group: Hind margin of supraanal plate excised, indented, or deeply divided medially. Subcercal processes present (sometimes greatly reduced). Species: *bispinulifera*; *centralis*; *fraserensis*; *penibifida*; *waterhousei*.

KEY TO MALES OF *DYAKINODES*

1. Hind margin of supraanal plate roundly convex, not distinctly indented or excavated medially (Figs 21A,22B) 2

Hind margin of supraanal plate distinctly excised medially (e.g., Figs 23A,24A) 3

2. Styles almost equal, slender, cylindrical (Figs 21B,E). Setal tuft on T7 arising from distinct mound (Fig. 21B); Pronotum subelliptical (Fig. 22A). Front femur Type B .... *kurandensis*

Right style short, robust, left style smaller, narrower (Fig. 22D). Setal tuft on T7 in shallow depression (Fig. 22E). Pronotum suboval (Fig. 22C). Front femur Type C .... *uptoni*

3. Supraanal plate transverse, subrectangular, with pair of long, slender, medial processes (Fig. 28B) .... *fraserensis*

Supraanal plate not as above 4

4. Supraanal plate excised medially forming pair of large, broadly rounded lobes bearing several long spines along their margins (Fig. 26B) .... *centralis*

Supraanal plate not as above 5

5. Hind margin of supraanal plate with shallow medial excavation and small dark spines along edge (Fig. 23C). Apex of median genital phallomere divided (Fig. 23B) .... *penibifida*

Hind margin of supraanal plate much more deeply excavated medially forming pair of triangular lobes. Apex of median genital phallomere not divided 6

6. Outer margins of triangular lobes of supraanal plate lined with small dark spines (Figs 24A,25A) .... *waterhousei*

Triangular lobes of supraanal plate each terminating in a spine, outer margins not spinose (Fig. 27B) .... *bispinulifera*

Dyakinodes kurandensis n.sp.
(Figs 21A-E,22A,29)

MATERIAL EXAMINED

HOLOTYPE: ♂ (terminalia slide 458), Kuranda north Queensland, 200m, 13.iii.1956, J.L. Gressitt; in BPBM.

PARATYPE: QUEENSLAND. QMBA: Windsor Tbld, 35km NNW of Carbine, NQ, Bargoo Ck, RF, 850m, 1♀, 15-18.iv.1982, Monteith, Yeates, and Cook.

DESCRIPTION

Male. Interocular space about same as distance between antennal sockets, slightly greater than interocellar space; fifth palpal segment enlarged, longer than the fourth. Pronotum subelliptical (Fig. 22A). Cubitus vein of hind wing thicker than other veins, cell formed by bases of median and cubitus veins small, cubitus vein with 1 complete and 3 incomplete branches, apical triangle absent (Fig. 21D). Front femur Type B_2 (with 4 small, stout proximal spines), pulvilli present on 4 proximal tarsomeres, tarsal claws simple, symmetrical, arolia present. Seventh abdominal tergum with large, semicircular, convexly raised, median elevation bearing dense setal tuft anteromedially (Fig. 21B). Supraanal plate with hind margin broadly rounded, entire, reaching hind margin of subgenital plate (Fig. 21B); paraprocts dissimilar, rectangular, right one larger without large, spinelike processes (Fig. 21A). Subgenital plate weakly asymmetrical, styles small, cylindrical, similar, widely separated, interstylar margin weakly oblique (Figs 21B,C,E). Genitalia as in Fig. 21E: hook on left side, with a subapical incision, median phallomere with distal region curved obliquely.

Colouration. Head dark brown, lower part of face lighter, gradually becoming darker dorsad. Pronotum dark brown, lateral edges and disk lighter. Tegmina brown, transparent, anterior area darker then posterior region; hind wings weakly infuscated, veins very distinct, dark brown. Abdominal terga light brown, lateral borders darker.

Female. Interocular distance slightly greater than space between antennal sockets. Hind wing with cubitus vein with 2 complete and 4 incomplete branches. Front femur Type B_2, with 4 stout proximal spines. Supraanal plate trigonal,

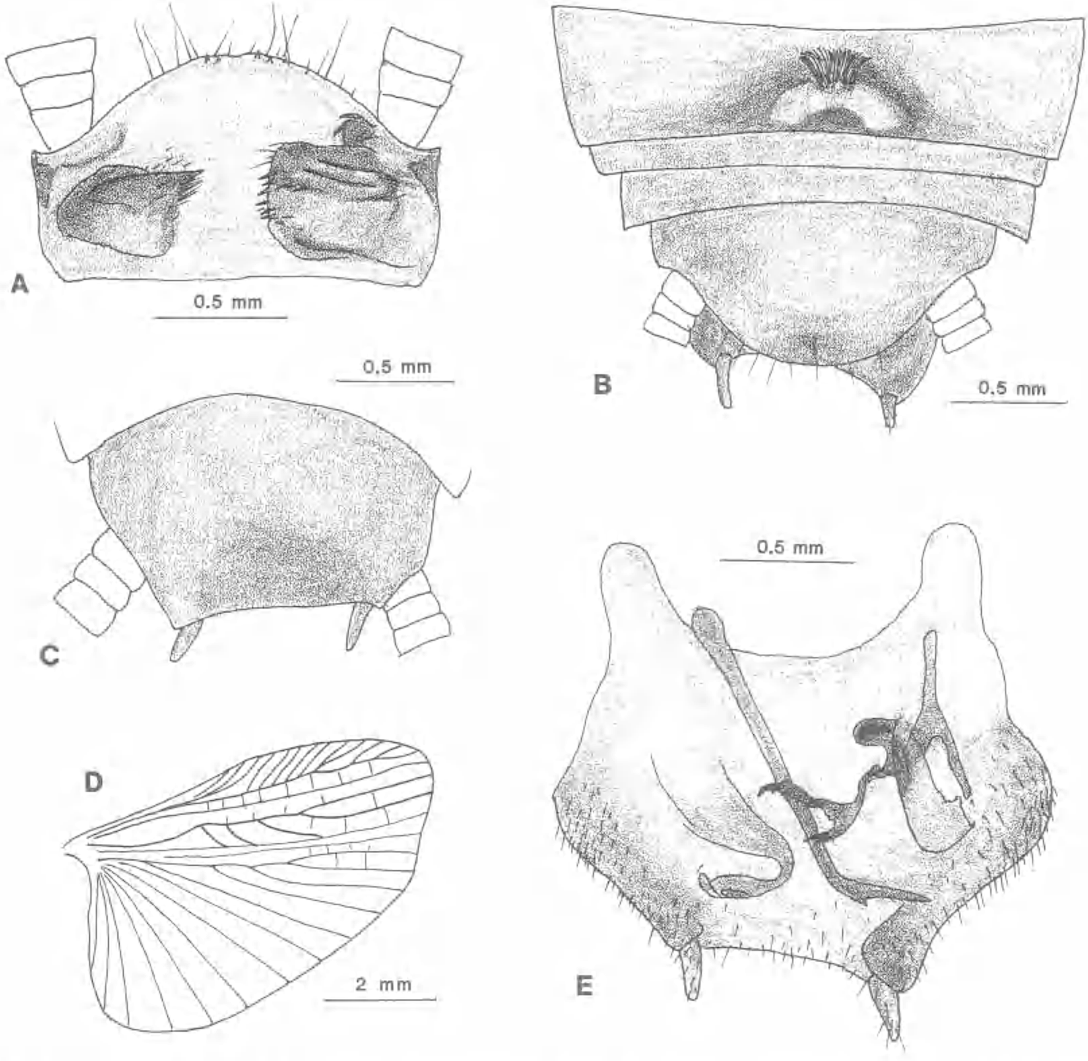

FIG. 21. *Dyakinodes kurandensis* n.sp., ♂ holotype: A, Supraanal plate and paraprocts (ventral); B, Abdominal tergum 7 to supraanal and subgenital plates (dorsal); C, Subgenital plate (ventral); D, Hind wing; E, Subgenital plate and genitalia (dorsal).

rounded apex almost reaching hind margin of subgenital plate. Top of head blackish shading to dark brown from middle of antennal sockets to yellowish clypeus and labrum. Pronotum with lateral edging yellowish brown, disk reddish brown, lateral and posterior regions dark brown. Tegmina reddish brown, humeral vein area dark brown, anterior edging and subcostal area yellowish, that part of right tegmen covered by left, colourless. Abdominal terga and sterna light brown. Cerci brown dorsally, ventral surface darker. Legs light brown.

Measurements (♀ in parentheses). Length, 7.5 (6.5); pronotum length x width, 1.9 x 2.7 (2.0 x 2.7); tegmen length, 7.7 (7.3).

Dyakinodes uptoni n.sp.
(Figs 22B-F, 29)

MATERIAL EXAMINED

HOLOTYPE: ♂ (terminalia slide 145), Bamaga, Cape York, Queensland, 26.iii.1964, I.F.B. Common and M.S. Upton; in ANIC.

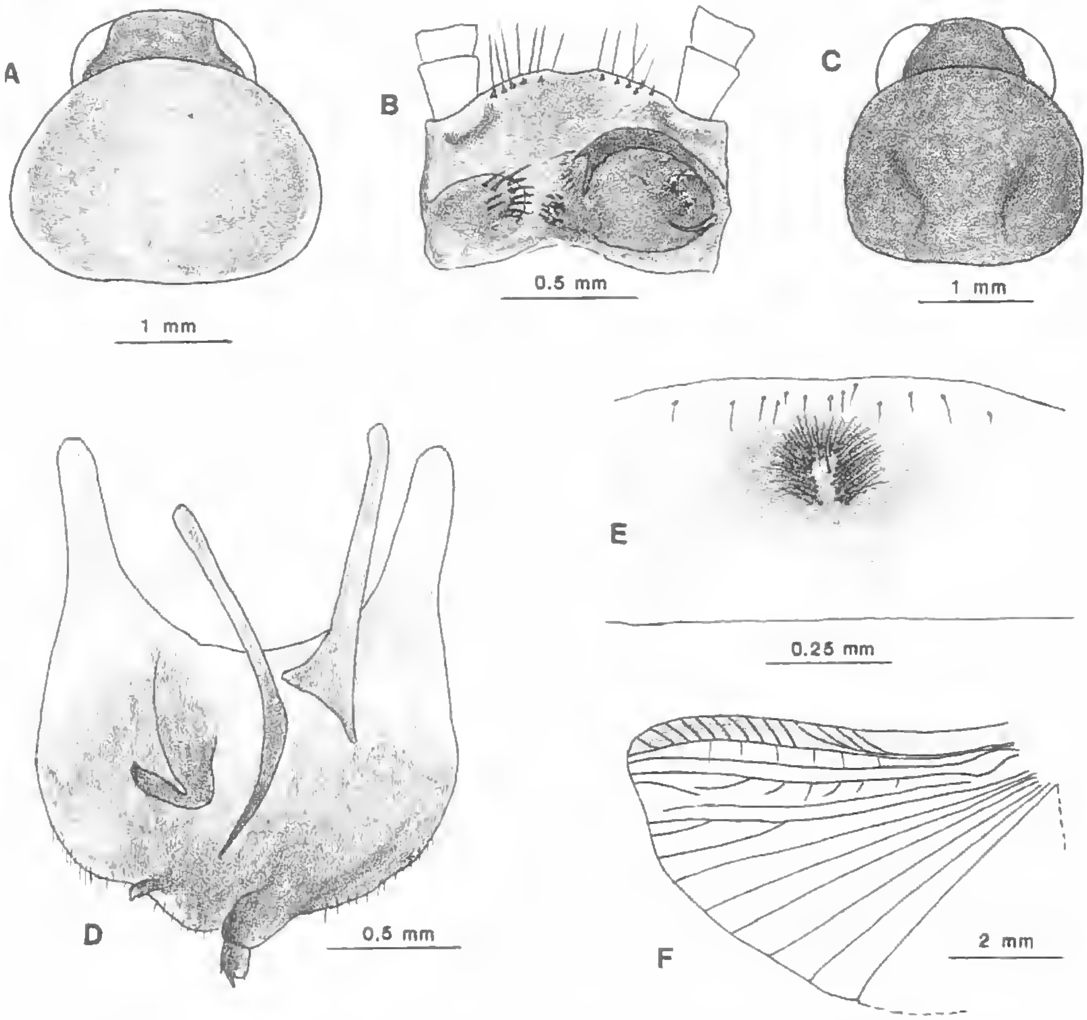

FIG. 22. *Dyakinodes* spp. A, *D. kurandensis* n.sp., ♂ holotype, pronotum. B-F, *Dyakinodes uptoni* n.sp., ♂ holotype: B, Supraanal plate and paraprocts (ventral); C, Pronotum; D, Subgenital plate and genitalia (dorsal); E, Tergal gland region on seventh segment; F, Hind wing.

DESCRIPTION

Male. Head with hardly any punctations between ocellar spots; interocular space slightly less than interocellar distance; fifth palpal segment larger than fourth. Pronotum suboval (Fig. 22C). Cubitus vein of hind wing with 1 complete (but apparently split in middle) and about 3 incomplete branches, cell formed by bases of median and cubitus veins, small, apical triangle absent (Fig. 22F). Front femur Type C_2 (stout proximal spines apparently absent). Seventh abdominal tergum with setal tuft on small mound in shallow depression (Fig. 22E). Supraanal plate with hind margin convex, some minute dark spines along margin ventrally; right paraproct with large, curved, apically bifid process, left paraproct simpler, with several large setae distally (Fig. 22B). Subgenital plate broadly rounded, right style short, bulbous, located on thickened dorsal region, left style smaller, more slender (Fig. 22D). Genitalia as in Fig. 22D: hook on left side, median phallomere curved on distal half, apex acute; some sclerites of right phallomere were probably lost in slide preparation.

Measurements. Length, 7.7; pronotum length x width, 1.6 x 2.0; tegmen length, 8.0.

Female. I am provisionally placing the following female here (non-paratype), pending collection of males from the same locality.

QUEENSLAND. ANIC: 3km NE of Mt Webb, near Cooktown, 1 ♀, 3.x.1980, T.A. Weir and R.A. Barrett.

The specimen lacks the dark areas on the pronotum and base of the coxae, and the dark brown regions on the subcostal and costal areas of the tegmina are greatly reduced.

Measurements. Length, 8.0; pronotum length x width, 1.8 x 2.2; tegmen length, 8.2.

Dyakinodes penibifida n.sp.

(Figs 23A-F,29)

MATERIAL EXAMINED

HOLOTYPE: ♂ (terminalia slide 148), Slaty Creek, 31km NE by E of Tenterfield, New South Wales, 16.xi.1982, D.C.F. Rentz and C.D. MacNeill, Stop 90; in ANIC.

ETYMOLOGY

The specific name refers to the divided apex of the male's median genital phallomere (virga).

DESCRIPTION

Male. Head with interocellar region and vertex minutely punctulate; interocular distance about same as distance between ocellar spots; fifth palpal segment longer than fourth. Pronotum suboval (Fig. 23E). Cubitus vein of hind wing with 1 complete and 6 small incomplete branches, cell formed by curved bases of median and cubitus veins, small; apical triangle absent (Fig. 23F). Front femur Type B_2, with 2 stout proximal spines, pulvilli present on 4 proximal tarsomeres, tarsal claws simple, symmetrical, arolia present. Seventh abdominal tergum with pair of deep, setose fossae, divided medially by mound bearing dense dark setal tuft (Figs 23A,D). Supraanal plate trigonal, apex shallowly excavated, deflexed, margins on either side of indentation with very small dark spines (Figs 23A,C); subcercal processes terminating in small spines; right paraproct with several robust, spinelike processes, left one simpler (Fig. 23C). Subgenital plate with pair of widely spaced, almost similar cylindrical styles (Figs 23A,B). Genitalia as in Fig. 23B: hook on left side, median phallomere apically bifid, right phallomere with subobsolete cleft sclerite.

Colouration. Head dark brown, vertex and occiput slightly lighter than rest of face. Pronotum dark brown, medial region lighter (Fig. 23E). Tegmina dark brown, basolateral half darker than rest of wing cover. Hind wing with part of subcostal and costal area and apex, darkly infuscated (Fig. 23F). Abdominal terga light brown, sides and terminal segments dark brown. Abdominal sterna with medial area up to subgenital plate, light brown, remainder dark brown. Coxae with brown basal maculae, remaining parts of legs very pale.

Measurements. Length, 10.7; pronotum length x width, 2.4 x 3.0; tegmen length, 12.0.

Dyakinodes waterhousei n.sp.

(Figs 24A,B, 25A-E, 29)

MATERIAL EXAMINED

HOLOTYPE: ♂, Mt Moffat, N.P., CQ, Top Shelter Shed, 1000m, 10-12.xii.1987, Monteith, Thompson, Yeates, in QMBA (Reg. No. T.11452).

PARATYPES: QUEENSLAND. ANIC: Moggill, near Brisbane, 1 ♂ (terminalia slide 150), ix.1966, G. Monteith. QMBA: Lake Clarendon, SEQ, 2♀♀, 11.xi.1971, E.C. Dahms.

ETYMOLOGY

The species is dedicated to Dr Douglas Waterhouse, retired Chief of CSIRO, Division of Entomology.

DESCRIPTION

Male. Head with few punctations on vertex; interocular space about same as distance between ocellar spots; fifth palpal segment swollen, longer than fourth. Pronotum suboval (Fig. 25C). Tegmina and wings fully developed. Hind wing with cell formed by curved bases of median and cubitus veins small but distinct; cubitus vein with 1 complete and some small incomplete branches and cross veins, apical triangle absent (Fig. 25B). Front femur Type B_2, with 3 or 4 stout proximal spines; pulvilli present on 4 proximal tarsomeres, tarsal claws symmetrical, simple, arolia well developed. Seventh abdominal tergum with a pair of fossae divided by large dark setose mound (Fig. 25D). Supraanal plate hind margin deeply excavated forming pair of lobes with small dark spines near their acute apices; bottom margin of excavation truncate, membranous, colourless, with few dark spines

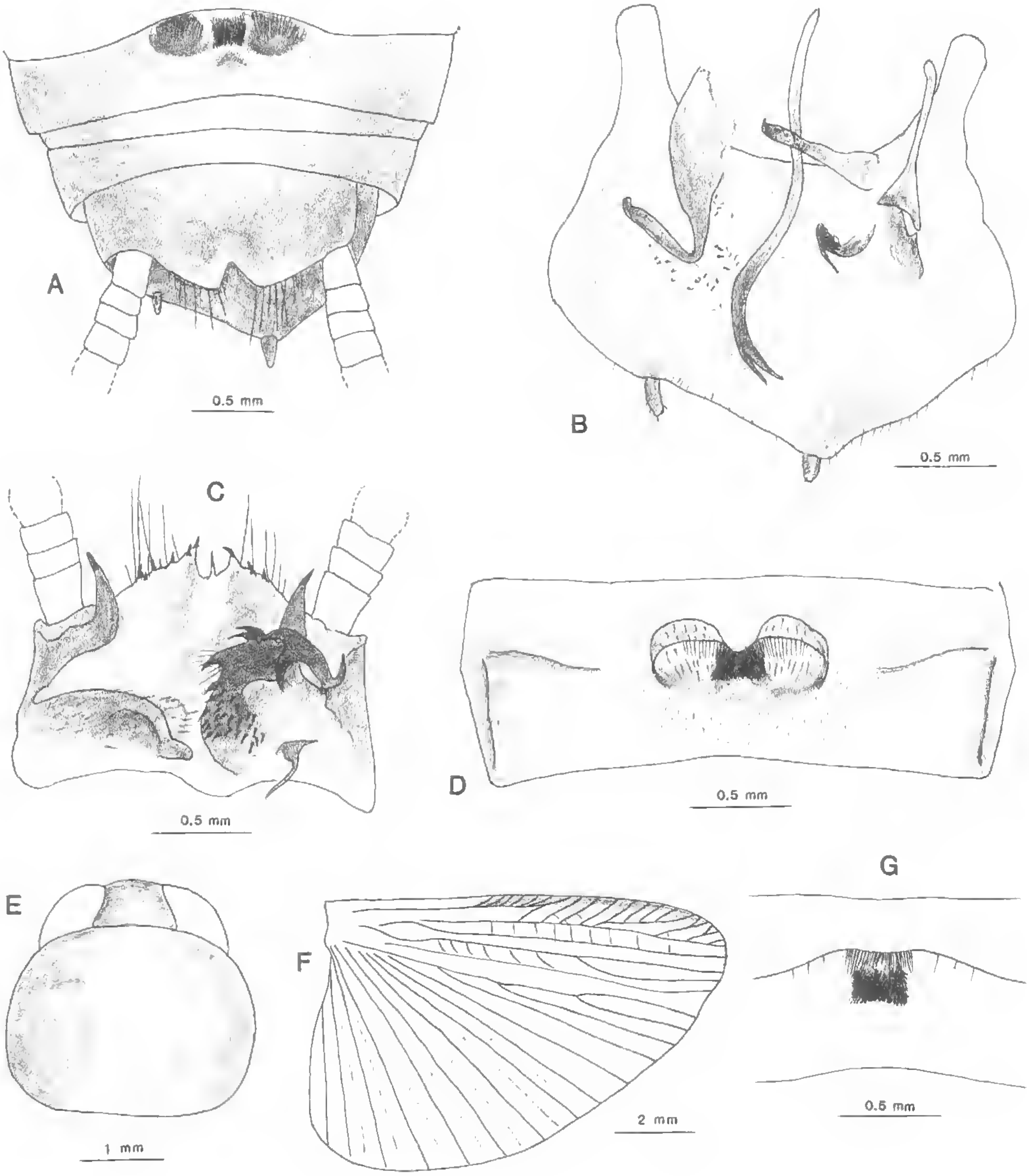

FIG. 23. *Dyakinodes* spp. A-F, *D. penibifida* n.sp., ♂ holotype: A, Seventh abdominal tergum to supraanal and subgenital plates; B, Subgenital plate and genitalia (dorsal); C, Supraanal plate and paraprocts (ventral); D, Seventh abdominal tergum; E, Pronotum; F, Hind wing. G, *Dyakinodes centralis* (Walker), ♂ from Upper Kangaroo River, NSW, Australia, glandular region of seventh abdominal tergum.

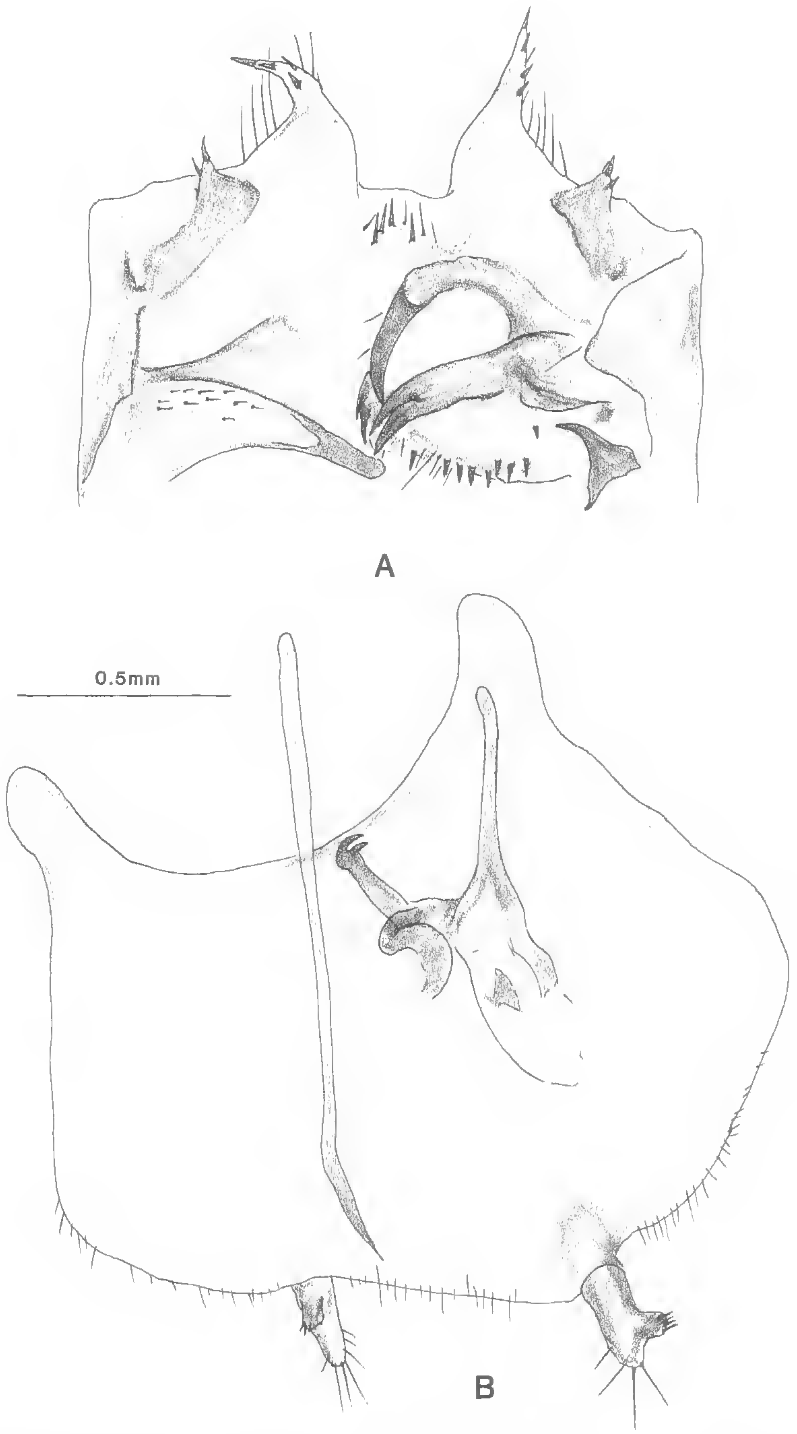

FIG. 24. *Dyakinodes waterhousei* n.sp., ♂ paratype from Moggill, Qld: A, Supraanal plate and paraprocts (ventral); B, Subgenital plate and genitalia (dorsal).

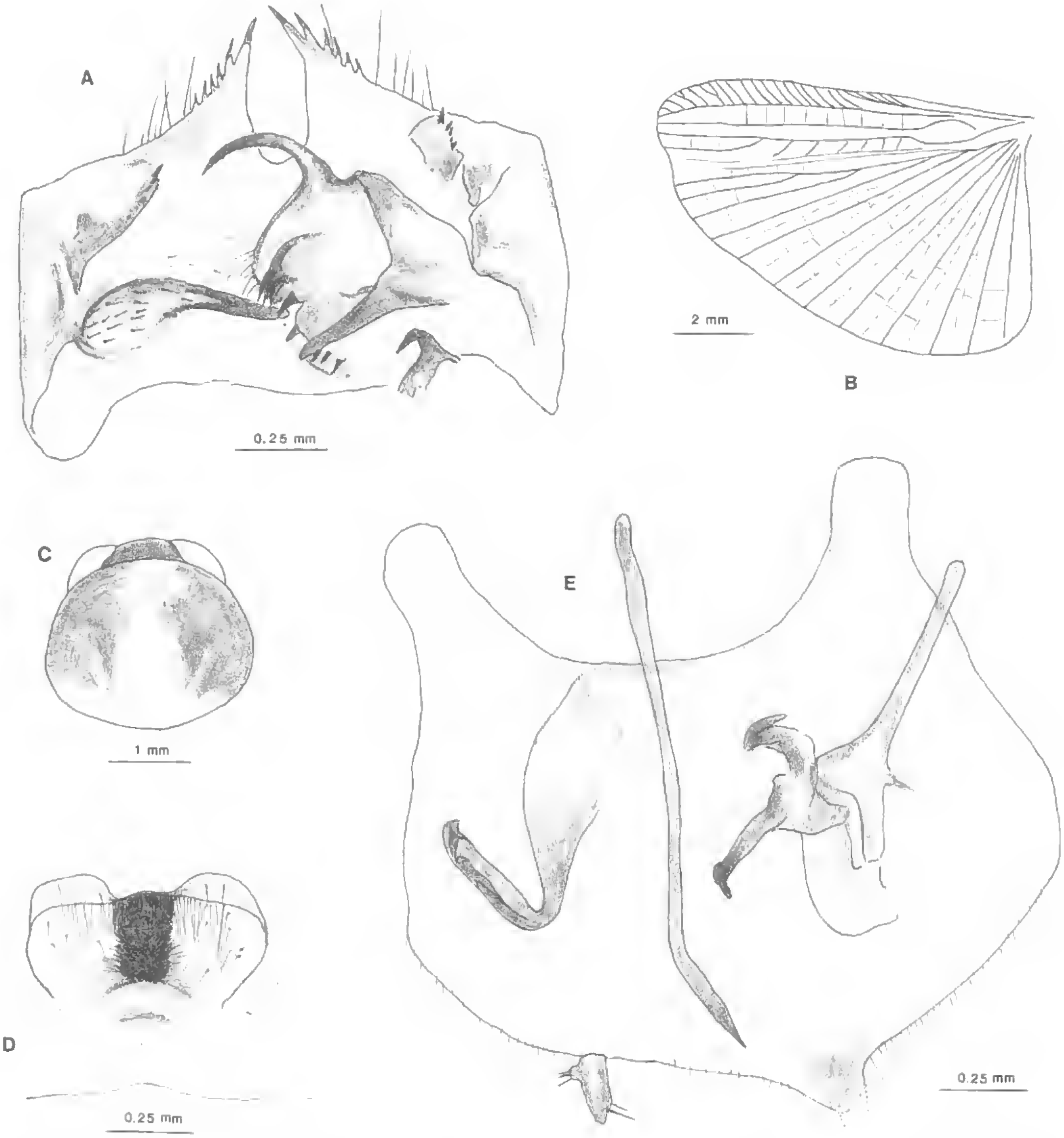

FIG. 25. *Dyakinodes waterhousei n.sp.*, ♂ variant from 4 miles southwest of Mudgee, NSW: A, Supraanal plate and paraprocts (ventral); B, Hind wing; C, Pronotum; D, Gland on seventh abdominal tergum; E, Subgenital plate and genitalia (dorsal).

ventrally; subcercal processes reduced; left paraproct with single, apically rounded process, right paraproct with pair of large spinelike processes, one strongly curved, the other apically divided (Fig. 24A). Subgenital plate with pair of weakly dissimilar styles, each with a small lateral, apically spined tubercle (Fig. 24B). Genitalia as in Figs 24B (hook lost in slide preparation), 25E: hook on left side, median phallomere slender, apically acute, right phallomere includes a reduced cleft sclerite.

Colouration. Head dark brown, occiput lighter reddish brown, clypeus pale, antennae with several black basal segments, rest pale. Pronotum with dark brown lateral areas which do not reach hind margin, remainder lighter (Fig.

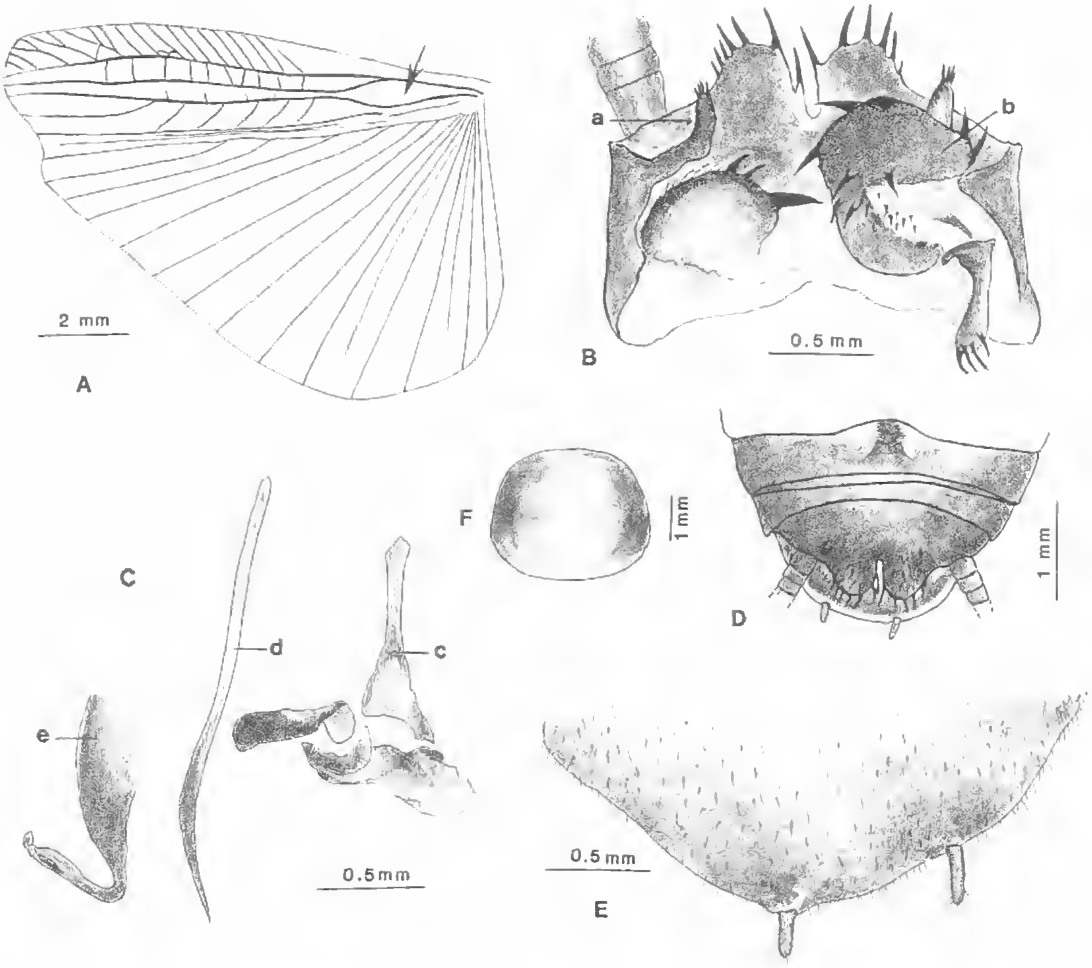

FIG. 26. *Dyakinodes centralis* (Walker), ♂ from Upper Kangaroo River, NSW: A, Hind wing (arrow indicates cell formed by curved bases of median and cubitus veins); B, Supraanal plate and paraprocts (ventral); C, Genitalia (dorsal); D, Abdominal tergum 7 to supraanal and subgenital plates; E, Distal region of subgenital plate showing styles (ventral). Abbreviations: a, left subcercal process; b, right paraproct; c, right phallomere; d, median phallomere; e, hooklike left phallomere.

25C). Tegmina with humeral area dark brown, remainder light brown, hyaline. Subcostal and costal vein areas of hind wing yellowish, remainder almost colourless. Abdominal terga yellowish brown with broad lateral zones dark brown. Abdominal sterna with broad lateral areas, and subgenital plate dark brown, remainder lighter reddish brown. Cerci dorsally pale with dark brown lateral edges, ventrally uniformly dark brown. Legs pale except for dark coxal bases.

Female. Cubitus vein of hind wing with 1 complete and 5-6 incomplete branches and cross veins. Front femur Type B_2, with 2 small stout proximal spines. Supraanal plate strongly trigonal, rounded apex extending slightly beyond hind margin of subgenital plate. Head blackish, including occiput; antennae uniformly pale. Pronotum with more extensive dark brown areas than in male.

Measurements (♀ in parentheses). Length, 10.8- 12.3 (8.3-10.4); pronotum length x width, 1.9-2.4 x 2.3-3.0 (1.9- 2.0 x 2.3-2.4); tegmen length, 10.0-11.1 (8.9-10.0).

VARIANT

NEW SOUTH WALES. ANIC: 4 miles SW of Mudgee, 32.36S 149.35E, 1♂ (terminalia slide 151), 18.xi.1968, Britton and Misko.

This male shows some minor differences in the shape of the excavation of supraanal plate, and right paraproct (cp. Figs 24A, 25A).

Dyakinodes centralis (Walker)
(Figs 23G, 26A-E, 29)

Ischnoptera centralis (Walker), 1868, p.120 (♀).
Apolyta centralis (Walker): Tepper, 1893, p.48.
Ischnoptera brunneonigra Tepper, 1895, p.155 (♀); Shaw, 1916, p.86 (♂) [misidentification]; Princis, 1969, p.1002 (sp. *incertae sedis*); Roth, 1985a, p.212 (sp. *incertae sedis*). n.syn.
Dyakinodes victoriae Princis, 1951, p.67, pl.6, figs 66,67 (♂); 1959, p.140.
Dyakinodes centralis (Walker): Princis, 1959, p.140; 1969, p.994.

MATERIAL EXAMINED

HOLOTYPE: ♀, South Australia, presented by R. Bakewell: in BMNH.

ADDITIONAL MATERIAL: VICTORIA. NMVM: Fernshaw, ♀ holotype (no. 4457) of *Ischnoptera brunneonigra* Tepper. UZMC: ♂ holotype of *Dyakinodes victoriae* Princis, Hauschild [no exact locality].

AUSTRALIAN CAPITAL TERRITORY. ANIC: Black Mt., 35.17S 149.06E, 1♂, 5.i.1987, 2♂♂, 19.i.1987, D.C.F. Rentz; Wombat Ck, 6km NE of Piccadilly Circus, 750m, 35.19S 148.51E, 1♀, flight intercept window trough trap, i.1985, Weir, Lawrence, and Johnson; Mt Ainslie, 1♂, 1♀, 10.i.1966, 1♂, 11.i.1966, M.S. Upton; Black Mt., light trap, 1♂, 12.xii.1967, I.F.B. Common.

NEW SOUTH WALES. ANIC: Depot Beach, 10 miles NE of Batemans Bay, 1♂, 27.x.1967, I.F.B. Common; 7 miles west of Rosebank, 1700ft., 1♂, 8.xi.1961, I.F.B. Common and M.S. Upton; Chiswick Exp. Stn, 1 (terminal abdominal segments missing), 10.i.1970, R.J. Roberts. MCZH: Upper Kangaroo River, 1♂ (terminalia slide 223), 28.i.1968, K.H.L. Key. DARA: Barrengr. F.R. [?Barrengarry], 3♂♂, at pressure lamp, 15.1.1966, C.E. Chadwick; Bundeen, 1♂, 11-12.xi.1958, R.H. Mulder. SAMA: Forest Reefs, 1♂, Lea.

QUEENSLAND. ANIC: 'Coonardoo', Fletcher, 1♂ (terminalia slide 147), 4.xii.1966. T.G. Campbell.

DESCRIPTION

Male. Head with interocellar region minutely punctulate; interocular distance about same as space between antennal sockets; last palpal segment enlarged. Pronotum suboval (Fig. 26F). Tegmina and wings fully developed. Hind wing with cell formed by curved bases of median and cubitus rami well developed, cubitus with 1 complete and 2-5 incomplete branches, apical triangle absent (Fig. 26A). Front femur with 1-4 large proximal spines, followed by row of piliform spinules, 2 (rarely 3) large terminal spines (Type B_2 or B_3); pulvilli on 4 proximal tarsomeres, tarsal claws symmetrical, simple, arolia present. Seventh abdominal tergum with transverse fossa and setose medial mound (Figs 23G,26D). Supraanal plate with hind margin divided medially forming two broadly rounded lobes bearing large spines along the edges; subcercal processes capped by several small spines; right paraproct large, bulbous, bearing stout, dark spines, left paraproct smaller, with fewer dark spines (Fig. 26B). Subgenital plate with pair of similar, cylindrical styles (Figs 26D,E). Genitalia as in Fig. 26C: hook on left side with a subapical incision, median phallomere slender, tapering to acute apex.

Colouration. Head dark brown, vertex yellowish brown; palps whitish or pale, terminal segments weakly infuscated. Pronotal disk yellowish brown, lateral regions dark brown (Fig. 26F). Tegmina with mediastine field and proximal half of scapular field dark brown. Abdominal terga brownish yellow, lateral portions and T9 and supraanal plate dark brown. Abdominal sterna medially brownish yellow, broad lateral regions dark brown. Cerci brown dorsally and ventrally. Coxae with basal dark brown maculae, those on mid and hind legs much larger than spots on front coxae; remaining parts of legs pale.

The amount of dark brown on head, pronotum, tegmina, abdominal segments, and legs varies. A male from Fletcher, Queensland is very pale, lacks dark brown on pronotum and tegmina, although coxae and abdominal segments have dark markings; its supraanal plate, styles, and genitalia are similar to typical material. A male from Depot Beach, New South Wales., has all parts of the legs dark brown.

Female. Supraanal plate trigonal, apex rounded extending slightly beyond hind margin of supraanal plate. In very dark forms, coxae are completely dark brown.

Measurements. (♀ in parentheses). Length, 11.0-13.5 (11.7-12.8); pronotum length x width, 2.5-2.8 x 3.4-3.7 (2.6-2.8 x 3.4-3.6); tegmen length, 11.8-13.8 (11.7-12.5).

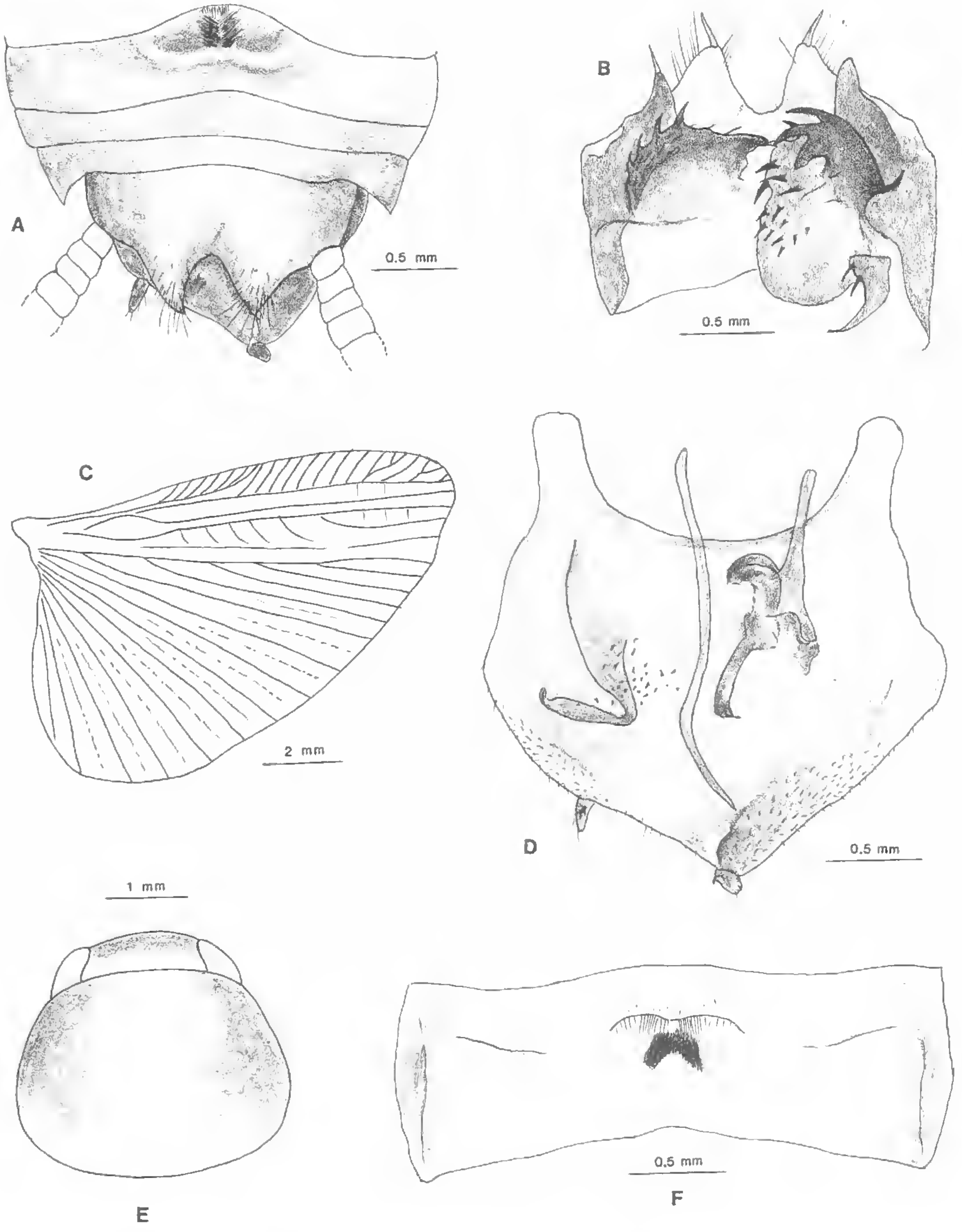

FIG. 27. *Dyakinodes bispinulifera* n.sp., ♂ holotype: A, Seventh abdominal tergum to supraanal and subgenital plates; B, Supraanal plate and paraprocts (ventral); C, Hind wing; D, Subgenital plate and genitalia (dorsal); E, Pronotum; F, Seventh abdominal tergum.

REMARKS

Tepper (1895, p.155) described *Ischnoptera brunneonigra* from a female from Fernshaw, Victoria, and indicated it is housed in the National Museum Melbourne. This specimen is very dark and greasy and it is difficult to determine its colour. However, it is clearly a *Dyakinodes* because its wings, though badly damaged, show the characteristic cell formed by the curved bases of the median and cubitus veins. Two other male specimens from Fernshaw, and labelled *Ischnoptera* n.sp. by Tepper, have no type status, because he described only the female. One of these specimens is *centralis*. The other male lacks most of the abdomen, but T1 and T2 are present and the former segment is specialised and the median and cubitus veins do not form a basal cell. It is not a *Dyakinodes*, although its front femur is Type B.

Shaw (1916, p.86) described what he believed to be the male of *Ischnoptera brunneonigra* from Healesville, Victoria, and called them cotypes. His description clearly shows that it is not *brunneonigra* because T1 and T7 are modified, and the front femur is Type A (4 large spines occupying the middle third succeeded distally by a row of smaller spines).

Dyakinodes bispinulifera n.sp.
(Figs 27A-F, 29)

MATERIAL EXAMINED

HOLOTYPE. ♂ (terminalia slide 149), Ruby Creek, 1 mile west of Amosfield, New South Wales, 15.xii.1966, T.G. Campbell; in ANIC.

ETYMOLOGY

The specific name refers to the 2 spines, 1 at the apex of each triangular lobe formed by the deep excavation of the supraanal plate hind margin.

DESCRIPTION

Male. Head minutely punctulate from interocellar region to vertex; interocular space about same as distance between antennal sockets. Pronotum suboval (Fig. 27E). Cell formed by curved bases of median and cubitus veins distinct; cubitus vein with 1 complete and 5 incomplete branches, apical triangle absent (Fig. 27C). Anteroventral margin of front femur Type B_2, with 2 small, stout proximal spines; pulvilli present on 4 proximal tarsomeres, tarsal claws symmetrical, simple, arolia present. Seventh abdominal tergum with a fossa divided by a mound bearing dense, golden, setal tuft (Figs 27A,F). Hind margin of supraanal plate with deep U-shaped excavation forming pair of deflexed lobes, apices curled, each lobe bearing an apical spine (Figs 27A,B); subcercal processes dissimilar, right one more robust without apical spine (this may be aberrant), left one trigonal with apical spine; paraprocts dissimilar, right one complex with dark sclerite bearing large spinelike processes (Fig. 27B). Subgenital plate trigonal, styles small, weakly dissimilar (Figs 27A,D). Genitalia as in Fig. 27D: hook on left side; median phallomere slender, rodlike, apex acute.

Colouration. Head dark brown, occiput yellowish brown (Fig. 27E). Pronotum yellowish brown, lateral regions darkly infuscated for about two-thirds its length (Fig. 27E). Tegmina hyaline, pale, subcostal area weakly infuscated. Abdominal terga yellowish brown, broad lateral areas and terminal segments darker. Abdominal sterna with broad, light brown, medial stripe, lateral borders and subgenital plate dark brown. Cerci brown. Basal regions of coxae dark brown, remaining parts of legs very pale.

Female. Unknown.

Measurements. Length, 11.0; pronotum length x width, 2.0 x 3.1; tegmen length, 12.5.

Dyakinodes fraserensis n.sp.
(Figs 28A-F, 29)

MATERIAL EXAMINED

HOLOTYPE: ♂ (terminalia slide 146), Fraser Island, Queensland, 19km SSW of Indian Head, 25.10S 153.17E, 11- 14.x.1978, D.C.F. Rentz and J. Balderson, Stop 120; in ANIC.

PARATYPE: Fraser Island. ANIC: same data as holotype, 1♀.

DESCRIPTION

Male. (Habitus shown in Fig. 28A). Head with vertex minutely punctulate; interocular space about same as distance between ocellar spots; fifth palpal segment longer than fourth. Tegmina and wings fully developed extending beyond end of abdomen. Hind wing with a small cell formed by curved bases of median and cubitus veins; cubitus vein with 1 complete and about 3 incomplete branches and few cross veins, apical triangle absent (Fig. 28E). Anteroventral margin of front femur Type B_2, with 2 stout proximal spines; pulvilli present on 4 proximal tarsomeres, tarsal claws symmetrical, simple, arolia present.

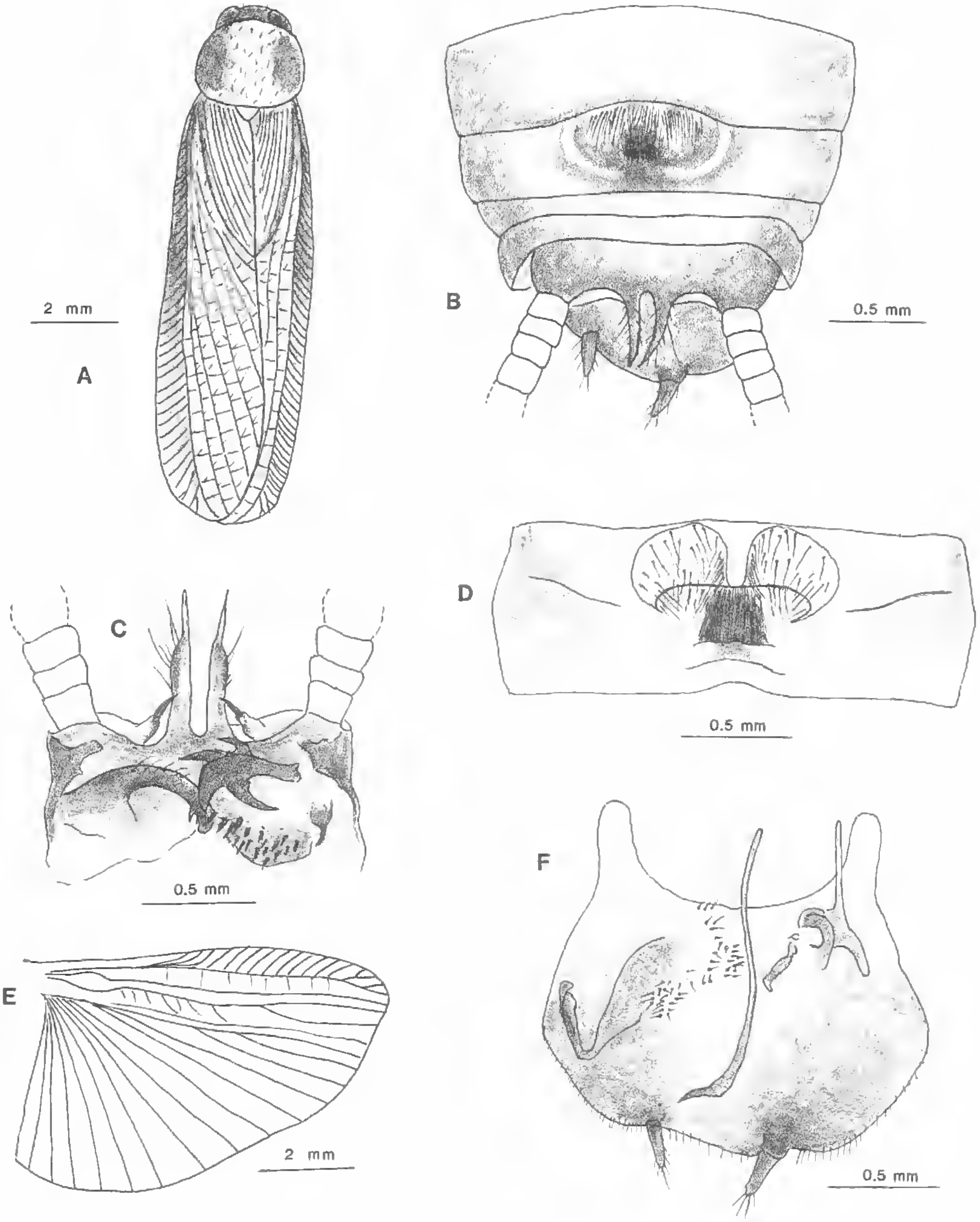

FIG. 28. *Dyakinodes fraserensis* n.sp., ♂ holotype: A, Habitus; B, Abdominal tergum 6 to supraanal and subgenital plates; C, Supraanal plate and paraprocts (ventral); D, Seventh abdominal tergum; E, Hind wing; F, Subgenital plate and genitalia (dorsal).

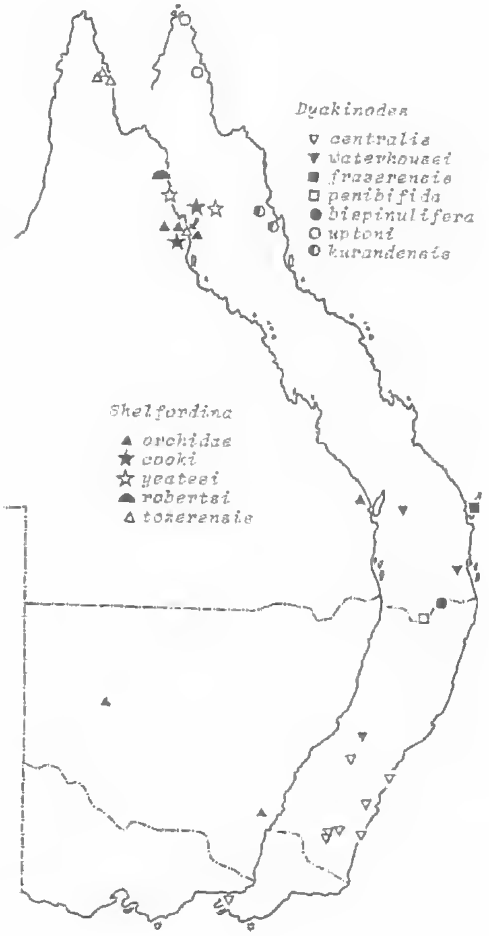

FIG. 29. Distribution of *Shelfordina* spp. and *Dyakinodes* spp. in Australia (the *D. waterhousei* record in New South Wales refers to the variant).

Seventh abdominal tergum with large transverse fossa and medial setose mound (Fig. 28B); KOH cleared preparation shows a pair of large, rounded sacs bearing scattered setae, in addition to the dense medial tuft (Fig. 28D). Supraanal plate transverse with pair of long, dark, slender processes that curve ventrad, their apices reaching hind margin of subgenital plate (Fig. 28B); between these processes and cerci, supraanal plate is membranous, colourless, with small subcercal processes each bearing an apical spine (Fig. 28C). Subgenital plate broadly rounded, convex, styles cylindrical, right one slightly more robust, arising from small tubercle on dorsal surface of plate (Fig. 28F). Genitalia as in Fig. 28F: hook on left side; median phallomere slender, slightly enlarged distally, apex acute.

Colouration. Head black, clypeus pale, labrum brownish. Pronotum yellowish brown with broad lateral areas very dark brown (Fig. 28A). Tegmina hyaline, yellowish brown, subcostal and basal half of costal areas infuscated (Fig. 28A). Costal region of hind wing light yellowish brown. Abdominal terga pale, laterally infuscated. Basal regions of coxae darkly infuscated, remaining parts of legs very pale.

Female. Supraanal plate trigonal, apex extending slightly beyond end of abdomen. Abdominal terga and sterna pale, lateral borders and terminal segments blackish.

Measurements (♀ in parentheses). Length, 8.5 (8.3); pronotum length x width, 1.9 x 2.3 (2.0 x 2.5); tegmen length, 9.1 (9.2).

Dyakinodes sp. A

MATERIAL EXAMINED

NEW SOUTH WALES. ANIC: Durras North, near Batemans Bay, 1♀, 10.i.1979, H.M. Cameron.

DESCRIPTION

Female. Head hidden under pronotum; punctulations on vertex indistinct; fifth palpal segment enlarged, longer than fourth. Pronotum subelliptical. Tegmina and wings fully developed. Hind wing with cell formed by curved bases of median and cubitus veins very large; cubitus vein with 2 complete and 3 incomplete branches, apical triangle absent. Front femur Type B_3, with 6 stout proximal spines, pulvilli present on 4 proximal tarsomeres, tarsal claws simple, symmetrical, arolia present. Supraanal plate trigonal, apex rounded protruding slightly beyond subgenital plate.

Colouration. Yellowish brown. Head pale, light reddish brown area between antennal sockets and eyes, blending gradually with pale occiput and lower part of face, interocular space almost smooth. Pronotum, tegmina, abdominal terga and sterna, and legs (including coxae), pale, dark infuscation absent. Dorsal surface of cerci pale, ventrally brown.

Measurements. Length, 9.0; pronotum length x width, 2.5 x 3.3; tegmen length, 10.0.

Anaplecta Burmeister

Anaplecta Burmeister, 1838, p.494; Bruijning, 1948, p.43; Hanitsch, 1928, p.6; Hebard, 1929, p.27; Princis, 1965, p.367.

TYPE SPECIES

Anaplecta lateralis Burmeister, by designation (Kirby, 1904, p.66) (type locality: Colombia, South America).

REMARKS

I have not seen Burmeister's types of the type-species *Anaplecta lateralis* from Colombia. However, I examined 5 males (1 with terminalia slide 426) from Panama (in ANSP) which Hebard (1920, p.15) determined as *lateralis*. I have seen additional specimens in MCZH from Barro Colorado Island, Panama Canal Zone (1♂, 1♀), and from Agua Caliente, Guatemala (14♂♂, 1 with terminalia slide 248, and 10♀♀). The type-species agrees with the diagnostic characters used for the genus, including basic features of the male genital phallomeres.

Hanitsch (1915, p.31) in his diagnosis of *Anaplecta* stated that the males lacked styles. Later in describing various species in the genus he stated that styles were present in some taxa but not others. The styles are small and may be overlooked unless slides are prepared of the subgenital plate. This is true of the types of *Anaplecta vittata* which Hanitsch described as females but are males (Fig. 31D). Females lack styles and have a valvular subgenital plate.

Descriptions of *Anaplecta* spp. have stressed wing venation and colouration (e.g. Shelford, 1906,pp.240-7). Often only 1 or 2 specimens were available or used by describers and there is no indication of the extent of variation in 'diagnostic' characters. Bruijning (1948, p.44) pointed out that differences in the number of costal veins and in the number of cross veins between the discoidal and median rami are variable and have no specific value; this is probably true in many cases. Colouration also may vary, and sometimes colour is not distinctive. Many of the described species are based on females and even when males were available their genitalia were not studied. These structures should be used, if possible, for specific determinations and to show species relationships. McKittrick (1964, p.26) studied only 3 *Anaplecta* (2 South American and 1 African) identified to genus only and stated that '... more than 1 genus is represented, to judge by differences in female genitalia.' The genus needs revision and at least the known species should be redescribed, using males when this sex is available.

AFFINITIES

Princis placed *Anaplecta* in the Anaplectidae: Anaplectinae. I follow McKittrick (1964, p.25) who believed the genus to be in the most primitive subfamily of the Blattellidae and one which has structures that '... bridge the gap between 2 superficially exceedingly different groups.' (i.e., Polyphagidae and Blattellidae).

DIAGNOSIS

Size small. Tegmina and wings usually fully developed, rarely with reduced tegmina and vestigial wings (1 species). In fully developed flight organs, tegmina narrow, usually with about 3 longitudinal or sublongitudinal sectors. Hind wings with cubitus vein simple, costal veins sometimes thickened distad, sometimes indistinct, with large subtriangular apical area (appendicular field) which when in repose is folded longitudinally and then reflexed over rest of wing; two weakly developed veins, one longitudinal along fold, the other somewhat oblique, may occur in appendicular field, other veins lacking; hind wing often infuscated, costal vein region and part of appendicular field darker than remaining parts. Anteroventral margin of front femur with few large proximal spines followed by row of piliform spinules, terminating in 2 large spines (Type B_2); tarsal claws simple, symmetrical, unspecialised (not serrated); pulvilli absent, or apparent on fourth tarsomere only; arolia present. ♂: Supraanal plate with medial specialisation. Styles present, similar or differing in size and/or shape. Genital hook on left side. ♀: subgenital plate valvular.

KEY TO ADULT *ANAPLECTA* OF AUSTRALIA

1. Tegmina reduced reaching to about T3 (Fig. 33A). Hind wings vestigial. Clypeus swollen (Fig. 33B) .... *brachyptera*

Tegmina and wings fully developed reaching to end of abdomen or beyond. Clypeus not swollen (Fig. 30A) 2

2. Tegmina with a pair of dark maculae separated by a transverse pale band (Fig. 30E), or maculae joined on one side (Fig. 30K) .... *calosoma*

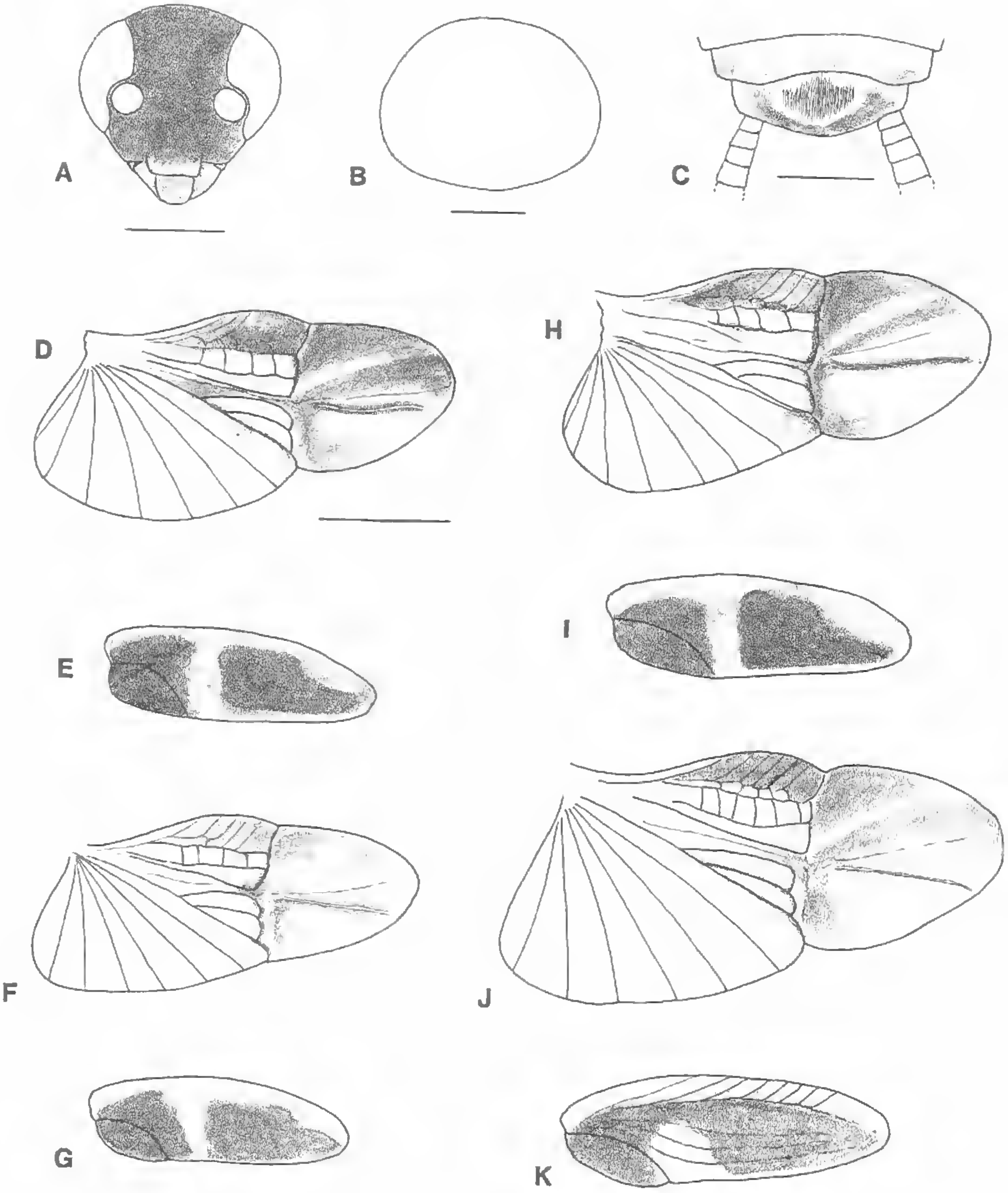

FIG. 30. *Anaplecta calosoma* Shelford. A-C, ♂ from 3km ENE of Mt Tozer, Queensland, head, pronotum, and terminal abdominal terga. D-K, Hind wings and tegmina: D,E, ♂ from 11km ENE of Mt Tozer; F,G, ♀ from Awar Bush, Papua New Guinea; H,I, ♂ from 6km ENE of Mt Tozer; J,K, ♀ from Moses Ck, 4km north by east of Mt Finnigan (veins not shown in Figs E,G,I). Scales (mm): A-C, 0.5; D, 2.0; E-K, same as D.

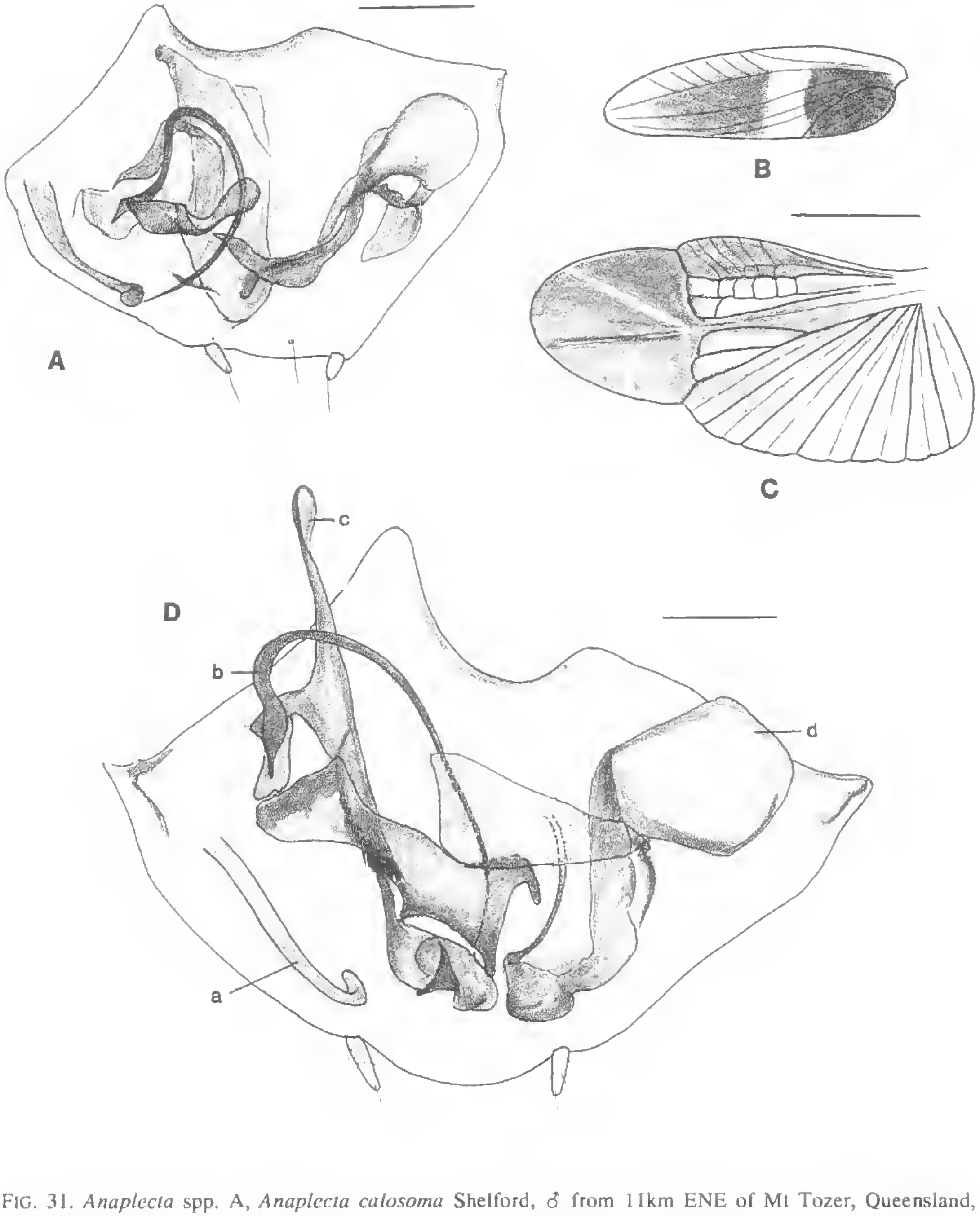

FIG. 31. *Anaplecta* spp. A, *Anaplecta calosoma* Shelford, ♂ from 11km ENE of Mt Tozer, Queensland, subgenital plate and genitalia (dorsal). B-D, *Anaplecta vittata* Hanitsch, ♂ paratype from Singapore: B, Left tegmen; C, Left wing; D, Subgenital plate and genitalia (dorsal; genital phallomeres: a, L3; b, L1; c, L2vm; d, R3 [L = left, and R = right phallomeres - terminology after McKittrick, 1964]). Scales (mm): A, 0.25; B,C, 2.0; D, 0.25.

Tegmina brown, unbanded (Fig. 32C), sometimes with a pale spot behind the anal vein (Fig. 32D) .... *australiensis*

DISTRIBUTION

Anaplecta is a large genus with more than 80 species in Central and South America, Asia and Africa (Princis, 1965, pp.367-80; 1971, p.1144; Bey-Bienko, 1969, p.839; 1970, p.533; Asahina, 1977, p.277). Until now it has not been recorded from Australia. Rehn (1904, p.542) described *Anaplecta platycephala* from Cairns but Hebard (1929, p.27, footnote 14) pointed out that it did not belong in this genus and later (Hebard, 1943, p.10) placed it in *Mediastinia* Hebard.

Distribution of Australian *Anaplecta* is shown in Fig. 34; not shown is the Northern Territory (near Darwin) record of *A. australiensis*.

Anaplecta calosoma Shelford
(Figs 30A-K, 31A, 34)

Anaplecta calosoma Shelford, 1912, p.51 (♀); Bruijning, 1947, p.215; Princis, (1953) 1954, p.212.

HOLOTYPE (not examined)

♀, German New Guinea (= Papua New Guinea), Tamimundung (= mouth of the Tami River); Shelford did not indicate where the type is housed; it is not in HDEO.

MATERIAL EXAMINED

The following specimens have the tegminal maculae completely separated by a transverse band (Figs 30E,G,I):

PAPUA NEW GUINEA. ISNB: Awar Bush, 1♂ (terminalia slide 2), 1♀, 6.vi.1982, 1♀, 21.vi.1982, P. Grootaert.

QUEENSLAND. ANIC: 3km ENE of Mt Tozer, 12.44S 143.14E, 28.v.- 4.vi.1986, 4♀♀ (Malaise trap/ethanol), J.C. Cardale, 4♂♂, 1♀ (Malaise trap), D.H. Colless, Quinn Park, Claudie River, 12.43S 143.17E, 1♂, 12- 21.ii.1985, E.D. Edwards and B. Hacobian. The following were collected by T. Weir and A. Calder: 3km ENE of Mt Tozer, 12.44S 143.14E, 3♂♂, 3♀♀, 28.vi.-4.vii.1986; 6km ENE of Mt Tozer, 12.44S 143.16E, 1♂, 30.vi.1986; 7km ENE of Mt Tozer, 12.43S 143.16E, 1♀, 1.vii.1986; 9km ENE of Mt Tozer, 12.435, 143.17E, 2♂♂, 1♀, 5-10.vii.1986; 11km ENE of Mt Tozer, 12.43S 143.18E, 2♀♀, 11-16 vii 1986. The following were collected by D.C.F. Rentz: 11km ENE of Mt Tozer, near Iron Range National Park, 12.43S 143.18E, rainforest margin, 1♀, 11.vii.1986, at light, 1♂ (terminalia slide 185), 6♂♂, 10♀♀, 11.vii.1986; 9km ENE of Mt Tozer, 12.43S 143.18E, Iron Range National Park, at light in rainforest, 2♂♂, 10.vii.1986; 3km ENE of Mt Tozer, near Iron Range National Park, 12.44S 143.14E, at light, 5♂♂, 6♀♀, 28.vi.-4.vii.1986; 2km NNE of Mt Tozer, Iron Range National Park, 12.44S 143.13E, at light, 1♀, 3.vii. 1986. QMBA: West Claudie R., Iron Range, flight trap, rainforest, 2♂♂, 3♀♀, 3-10.xii.1985, G. Monteith and D. Cook.

DESCRIPTION

Male. Interocular space greater than distance between antennal sockets (Fig. 30A). Pronotum subelliptical (Fig. 30B). Tegmina and wings reaching to end of abdomen or slightly beyond. Hind wing venation as in Figs 30D,F,H. Anteroventral margin of front femur Type B_2; pulvilli apparently absent, arolia present. Supraanal plate with medial specialisation, hind margin convexly rounded (Fig. 30C). Subgenital plate weakly asymmetrical, interstylar margin practically straight (Fig. 31A). Genitalia as in Fig. 31A; L1 with long, slender, curved filament.

Colouration. Head with labrum and clypeal region pale yellow, remainder dark brown (sometimes not uniformly so) (Fig. 30A). Pronotal disk yellowish without markings, surrounding region hyaline (Fig. 30B). Tegmina with pair of dark brown to blackish maculae that are completely separated by transverse pale band posterior to anal field, marginal field also pale or hyaline; size of maculae, especially distal one may vary (Figs 30E,G,I; see variant noted below). Hind wing with appendicular field and costal vein area infuscated, remaining areas less so (Figs 30D,F,H). Abdominal terga brownish yellow, lightly infuscated, glandular setae on T10 golden, surrounding area very pale (Fig. 30C). Abdominal sterna, legs, and cerci, pale brownish yellow.

Female. Supraanal plate with hind margin convexly rounded. Colour essentially as in male except base and lateral parts of valves near apex of subgenital plate reddish brown or dark brown.

Measurements (♀ in parentheses). Length, 3.9- 4.7 (3.8-5.0); pronotum length x width, 1.1-1.2 x 1.5-1.7 (1.0- 1.4 x 1.6-1.8); tegmen length, 3.1-4.5 (3.5-4.5).

VARIANT

This variant generally is larger than typical material and the tegminal maculae are joined on their anterior margins along the marginal field (Fig. 30K). Female subgenital plate dark brown laterally on each side of valves. Male genitalia similar to typical material. Most records near Kuranda.

Measurements (♀ in parentheses). Length, 4.5- 5.1 (4.5-5.6); pronotum length x width, 1.3-1.5 x 1.7-1.8 (1.3- 1.5 x 1.8-.1.9); tegmen length, 4.2-5.1 (4.6-5.2).

Material Examined

Queensland. ANIC: Kuranda State Forest, 3km north of Kuranda, 360m, flight intercept trap, rainforest, 2♀♀, 25.vi.- 3.viii.1982, S. and J. Peck; Black Mt. Road, 30km north of Kuranda, leafmould, rainforest, 1♀, 4.xi.1969, J.G. Brooks; Moses Creek, 4km north by east of Mt Finnigan, 1♀, 14-16.x.1960. T. Weir. The following were collected by Norris and Common: 3 miles north of Kuranda, 3♂♂, 1♀, 24.iv.1955; 1 mile east of Kuranda, 1♂ (terminalia slide 186), 2♂♂, 2♀♀, 4.v.1955. The following were collected by I.F.B. Common and M.S. Upton: 1 mile east of Kuranda, 1♀, 22.iii.1964, 1♂, 4♀♀, 19.vi.1964; 1 mile north of Kuranda, 1200ft, 3♀♀, 23.iv.1969.

Remarks

Anaplecta calosoma has banded tegmina which are not characteristic of most other species of the group. *Anaplecta vittata* Hanitsch also has banded tegmina and because of this similarity, Bruijning (1947, p.216) suggested that *vittata* may be a synonym of *calosoma*. Although *vittata* superficially resembles *calosoma*, their male genitalia are distinctly different. Although I have not seen the type of *calosoma*, the specimens from both Papua New Guinea and Australia are similar and agree well with Shelford's description.

Many specimens of *calosoma* in the series from the vicinity of Mt Tozer were collected at mercury vapour light at night. A galerucine chrysomelid beetle *Monolepta* sp. (nr *australis*) was collected with the cockroaches. The colour and pattern of cockroach and beetle are so remarkably similar that a mimicry association is indicated (Rentz, personal communication).

Anaplecta vittata Hanitsch

(Figs 31B-D)

Anaplecta vittata Hanitsch, 1923, p.396, fig. 1 (♂ not ♀ as indicated); 1929a, p.5; Hebard, 1929, p.8; Bruijning, 1947, p.217, fig. 2; 1948, p.51.

Material Examined

Holotype: ♂ (not ♀ as indicated), Singapore, Thomson Rd, Impounding Reservoir, xii.1922, C.J. Saunders; Type Orth. 256 ^{1}/2 in HDEO.

Paratype. Singapore. HDEO: same data as holotype. ♂ (not ♀ as indicated; terminalia slide 223), Type Orth. 256 ^{2}/2.

Description

Male. Interocular space slightly greater than distance between antennal sockets. Pronotum subparabolic, hind margin weakly produced. Tegmina and wings reach end of abdomen; hind wing venation as in Fig. 31C. Supraanal plate with medial setal specialisation, hind margin convexly rounded. Subgenital plate practically symmetrical, styles small, widely separated, interstylar margin symmetrically convex (Fig. 31D). Genitalia as in Fig. 31D; phallomere L1 with a long, curved filament.

Colouration. Head orange. Pronotal disk orangish, surrounding region hyaline. Tegmina black with broad transverse whitish band across about middle, marginal field pale or hyaline (Fig. 31B). Hind wing infuscated as in Fig. 31C. Abdominal sterna straw coloured.

Measurements. Length, 5.0; pronotum length x width, 1.3 x 1.7-1.8; tegmen length, 4.1-4.2

Remarks

Bruijning (1947, p.216) pointed out the discrepancies between Hanitsch's drawing (1923, fig. 1) of the hind wing of *vittata* and that of the wing of another specimen (cp. Bruijning, 1947, fig. 2b) which Hanitsch had identified as *vittata*. My drawing (Fig. 31C) of the hind wing of the paratype of *vittata* (which Hanitsch used for his drawing) agrees with Fig. 2b of Bruijning and shows that Hanitsch erred in his original drawing.

The male genitalia of *vittata* and *calosoma* are clearly different but both have a long curved filament-like sclerite (L1) indicating that both taxa are closely related (cp. Figs 31A and 31D).

Anaplecta vittata was originally described from Singapore but Hanitsch (1929a, p.5) also recorded it from Sumatra (Medan, Tjinta Radja, and Arnhemia), West Malaysia (Kuala Lumpur, and Batang Padang, Perak). Bruijning (1948, p.51) had specimens from Bintang (West Malaysia), Rhio Archipelago (Indonesia), and Medan.

Anaplecta australiensis n.sp.

(Figs 32A-F, 34)

Material Examined

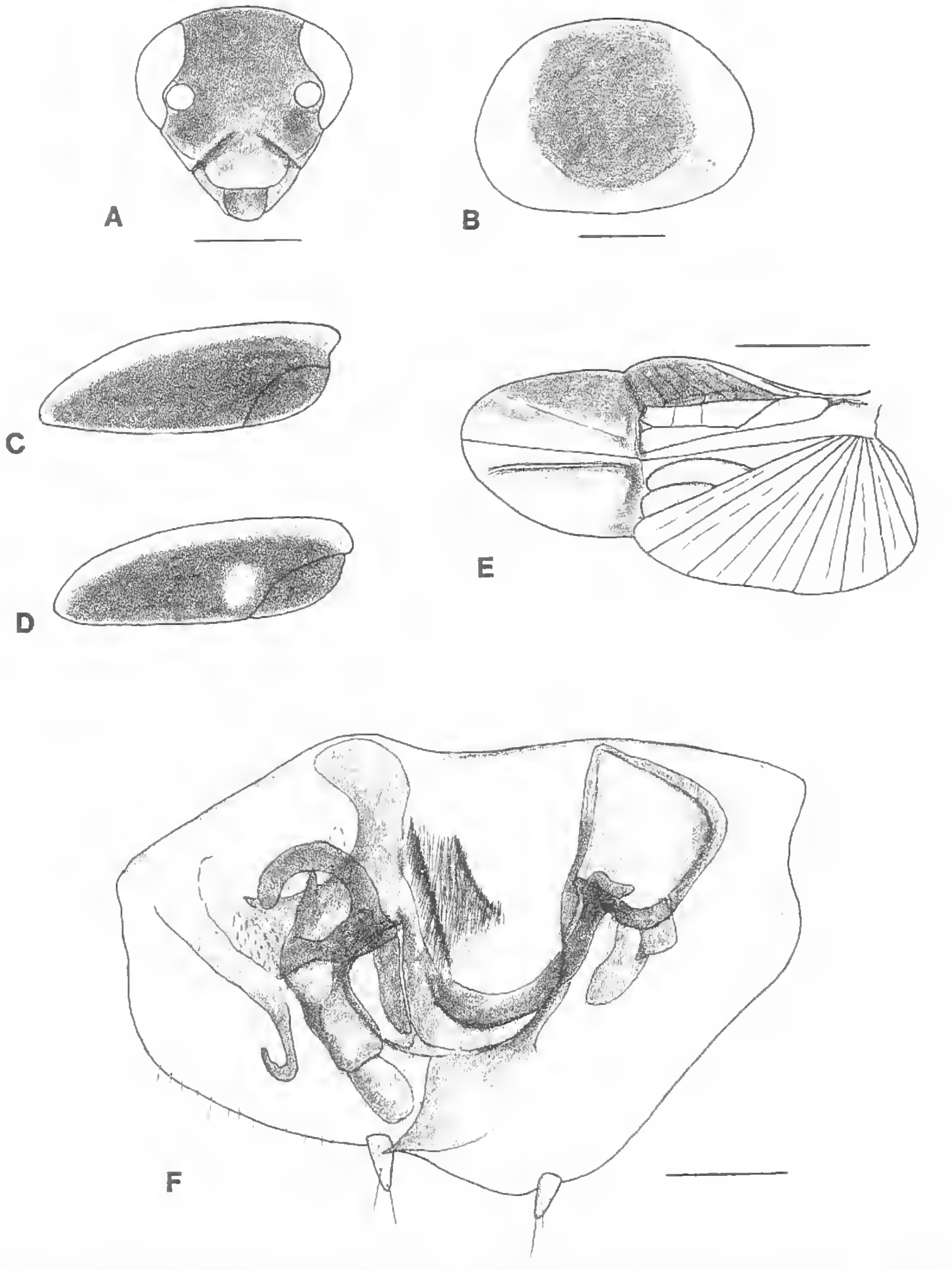

FIG. 32. *Anaplecta australiensis* n.sp. A,B, ♂ holotype, head and pronotum; C, ♀ paratype from 11km ENE of Mt Tozer, left tegmen (veins not shown); D-F, ♂ paratype from same locality as holotype, left tegmen (veins not shown), hind wing, and subgenital plate and genitalia (dorsal). Scales (mm): A,B, 0.5; C-E, 2.0; F, 0.25.

Holotype: ♂, 9km ENE of Mt Tozer, Queensland, 12.43S 143.17E, Malaise trap/ethanol, 5-10.vii.1986, J.C. Cardale; in ANIC (Reg. No. 8251).

Paratypes: Queensland. ANIC: same locality and data as holotype, 1♀, 2♀♀, (Malaise trap), D.H. Colless, 1♂ (terminalia slide 189), 3♀♀, T. Weir and A. Calder; 11km ENE of Mt Tozer, 12.43S 143.18E, 1♀ (Malaise trap/ethanol), 1 (abdomen missing; ex pantrap), 11-16.vii.1986, J.C. Cardale; 11km ENE of Mt Tozer near Iron Range National Park, 12.43S 143.18E, rainforest margin, 1♀, 11.vii.1986, D.C.F. Rentz; Cape Tribulation area, 16.03-16.05S 145.28E, littoral rainforest, 1♂, 1♀, 21-28.iii.1984, A. Calder and T. Weir.

Northern Territory. ANIC: Holmes Jungle (nr Darwin), 12.23S 130.57E, rainforest, 1♂, 6.xi.1972, R.W. Taylor.

Description

Male. Interocular space about same as distance between antennal sockets (Fig. 32A). Pronotum subelliptical (Fig. 32B). Tegmina and wings reaching slightly beyond end of abdomen. Hind wing as in Fig. 32E. Anteroventral margin of front femur with 3 large proximal spines, followed by row of piliform spinules terminating in 2 large spines (Type B_2); pulvilli absent, arolia small. Supraanal plate with medial setal specialisation, hind margin convexly rounded. Subgenital plate weakly asymmetrical, styles small, interstylar margin convexly skewed to left (Fig. 32F). Genitalia as in Fig. 32F; L1 without long, curved filament.

Colouration. Head brown, clypeal region brownish yellow (Fig. 32A). Pronotal disk brown, the colour extending to the anterior and posterior borders, lateral regions whitish or hyaline (Fig. 32B). Tegmina dark reddish brown, marginal field hyaline (Fig. 32C), costal veins whitish, sometimes with pale macula behind anal vein (Fig. 32D). Hind wing infuscated, darkest regions in costal vein area and anterior part of the appendicular field (Fig. 32E). Abdominal terga light brown with some darker infuscation, tergal gland region of supraanal plate pale, area behind it dark brown. Abdominal sterna brown, legs and cerci (dorsally) lighter, straw coloured.

Female. Interocular space less than distance between antennal sockets. Supraanal plate trigonal, apex rounded. Abdominal terga dark brown, anterior segments lighter. Abdominal sterna brown, subgenital plate with valves and lateral regions darker.

Measurements (♀ in parentheses). Length, 4.0-5.3 (4.1-5.5); pronotum length x width, 1.2-1.3 x 1.4-1.8 (1.2-1.4 x 1.5-1.9); tegmen length, 3.7-4.5 (3.5-4.5)

Remarks

The genital phallomere L1 of *australiensis* lacks a curved filamentous sclerite suggesting that it does not belong to the same species group as *calosoma* and *vittata*. Its close relatives may be determined by a study of the male genitalia of other species in the genus.

Anaplecta brachyptera n.sp.

(Figs 33A-C,34)

Material Examined

Holotype: ♂, Hinchinbrook Is., NEQ, Gayundah Ck, 10m, pitfalls, 8-18.xi.1984, Monteith, Thompson and Cook; in QMBA (Reg. No. T11190).

Paratypes. Queensland, QMBA: same locality as holotype, 18.22S 146.13E, rainforest, sieved litter, 10m, 5♂♂, 1♀, 10.xi.1984, 1♂ (terminalia slide 69), 1♀, 9.xi.1984, 1♂, 11.xi.1984, Thompson and Gallon.

Description

Male (habitus in Fig. 33A). Eyes somewhat reduced, interocular space distinctly greater than distance between antennal sockets (Fig. 33B). Clypeus swollen (Fig. 33B). Pronotum subparabolic. Tegmina reduced in length reaching only to about T3, apically rounded. Hind wings vestigial, lateral, reaching only to T1. Anteroventral margin of front femur with 1 or 2 proximal spines followed by row of piliform spinules with 2 large terminal spines (Type B_2); pulvilli absent, arolia small, tarsal claws symmetrical, simple. Supraanal plate (T10) with large setal specialisation located on mound arising from depressed region of transverse segment, hind margin weakly convex (Fig. 33A). Subgenital plate weakly asymmetrical, styles small, similar, interstylar margin weakly uneven, essentially not produced (Fig. 33C). Genitalia as in Fig. 33C; genital phallomere L1 with long, curved filament.

Colouration. Clypeus, labrum and mandibles yellowish, rest of head (Fig. 33B), pronotum, tegmina, and abdominal terga brown; glandular area on T10, cerci dorsally, abdominal sterna, and legs, lighter brown. Costal vein of tegmina and lateral edge of pronotum pale.

Female. Supraanal plate weakly trigonal, apex rounded. Subgenital plate valvular. Abdomen somewhat darker than male.

Measurements (♀ in parentheses). Length,

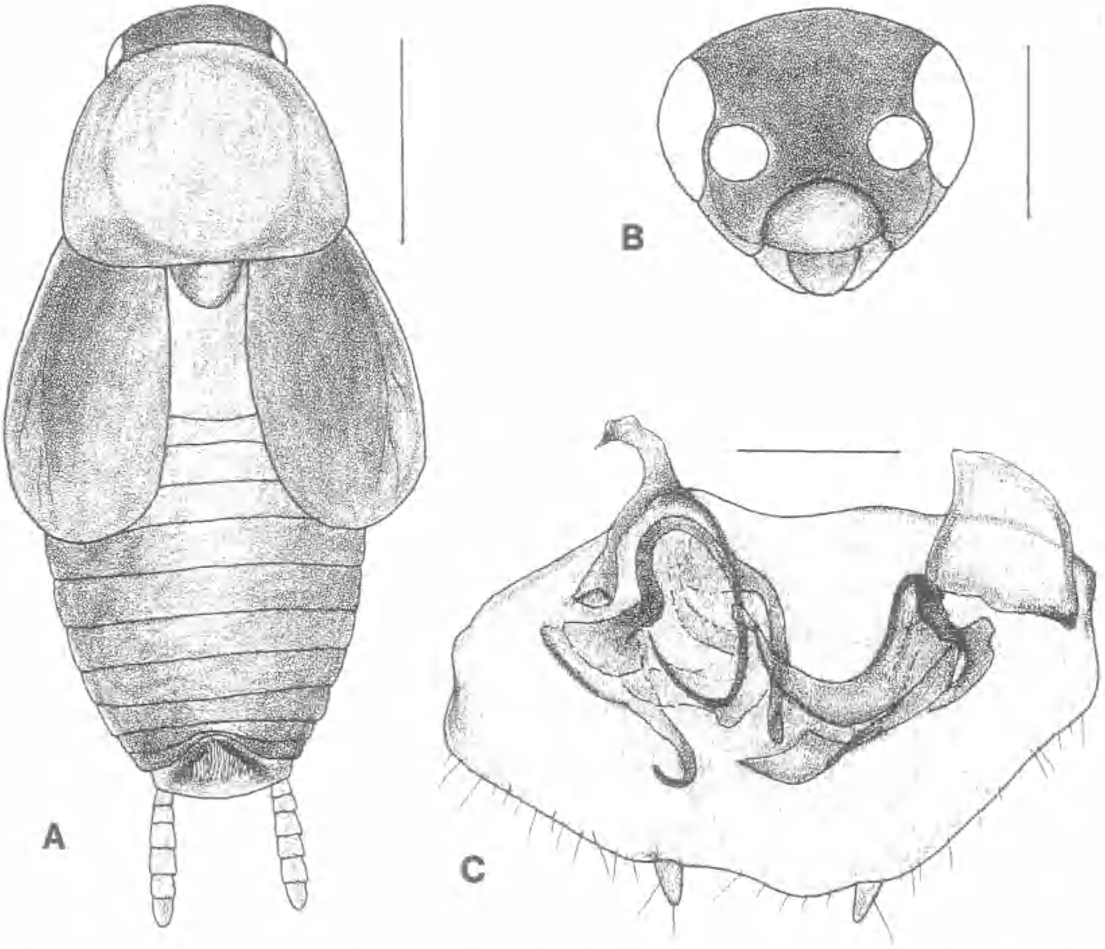

FIG. 33. *Anaplecta brachyptera* n.sp. A,B, ♂ holotype, habitus and head; C, ♂ paratype from same locality as holotype, subgenital plate and genitalia (dorsal). Scales (mm): A, 1.0; B, 0.5; C, 0.25.

3.2- 3.7 (3.6-3.7); pronotum length x width, 1.0-1.1 x 1.3-1.5 (1.1- 1.2 x 1.5); tegmen length, 1.3-1.4 (1.3-1.5).

REMARKS

Anaplecta brachyptera apparently is the only member of the genus with reduced tegmina and vestigial wings. All other characters are typical of the genus. The male's right genital phallomere resembles that of *A. australiensis*, whereas the left one (L1) has a long curved filament reminiscent of those found in *calosoma* and *vittata*.

Parectoneura new genus

TYPE SPECIES

Parectoneura bivittata n.sp.

DIAGNOSIS

Sexes similar. Tegmina and wings fully developed. Tegmina with distinct venation, branches of median and cubitus veins longitudinal. Hind wing when at rest folded along plical area, with apical triangle rolled up and curled in tight spiral (Fig. 35A); discoidal vein straight, unbranched, median and cubitus veins curved, former simple, latter with a complete branch, incomplete rami absent, apical triangle large (Fig. 35B). Anteroventral margin of front femur with some large proximal spines followed by row of piliform spinules, terminating in 2 large spines (Type B_2); tarsal claws symmetrical, minutely toothed on ventral margins; ventral margins of mid and hind femurs with some large spines. ♂: Seventh abdominal tergum weakly

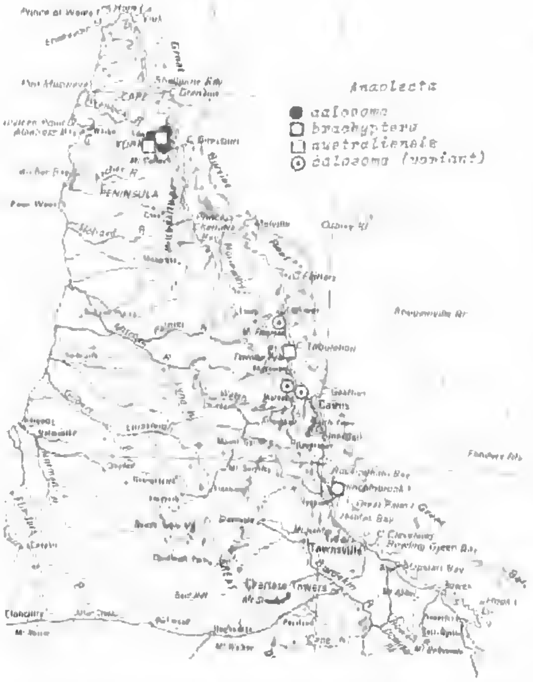

FIG. 34. Known distribution of Australian *Anaplecta* species in Queensland (Northern Territory record of *A. australiensis* not shown).

specialised (Fig. 35C). Subgenital plate subsymmetrical with a pair of minute, similar styles (Fig. 35D). Genital hook on left side, right phallomere reduced (Figs 35D,E).

REMARKS

Hebard (1943, p.12) placed *Ectoneura* in the Ectobiinae and the Australian species which previously had been referred to *Ectobius* in a group Ectoneurae. 'They agree with *Ectobius* in having the tegminal discoidal sectors oblique, the tarsal claws simple but asymmetrical, and the female subgenital plate simple. The general appearance of some of the species also suggests certain species of *Ectobius*. They differ widely from that genus and its allies, however, in having the ventral margins of the median and caudal femora unarmed, the ventrocephalic margins of the cephalic femora practically unarmed [there are fine hairs which are more slender than piliform spinules] with one or two large terminal spines, and the intercalated triangle of the wings (in all individuals having these organs fully developed), curled when at rest, instead of folded, with anal vein there diverging very strongly from the median fold'.

The new genus *Parectoneura* superficially resembles species of *Ectoneura*, especially those taxa that have a pair of pronotal bands which continue along the full length of the tegmina, e.g. *Ectoneura minima* (Tepper), *E. verticalis* Hebard, and *E. suffusa* Hebard. It agrees with *Ectoneura* in having the apical (= intercalated) triangle of the hind wing curled when at rest, and a gland on the male's seventh abdominal tergum. It differs in having Type B_2 front femur, symmetrical, minutely toothed tarsal claws (vs. asymmetrical and untoothed) and some large spines on the ventral margins of the mid and hind femurs, which in *Ectoneura* are essentially unarmed. The *Parectoneura* male has a subsymmetrical subgenital plate with a pair of minute styles, whereas in *Ectoneura* the subgenital plate is distinctly asymmetrical and there is only one minute style. Hind wings in which the apical triangle is curled into a tight spiral when at rest are found in some other genera, e.g., *Oulopteryx* Hebard and *Dasyblatta* Hebard, both from South America (Hebard, 1921b; Rehn, 1951), *Areolaria* Brunner from the Malay Archipelago (Hebard, 1929, p.102), and *Pseudectoneura* Princis (New Caledonia), and *Theganopteryx* Brunner (Africa).

Parectoneura bivittata n.sp.
(Figs 35A-F)

MATERIAL EXAMINED

HOLOTYPE, ♂, Tindal, Northern Territory, Australia, 14.31S 132.22E, 1-20.xi.1967, light trap, W.J.M. Vestjens; in ANIC.

PARATYPES: NORTHERN TERRITORY. ANIC: Tindal, 8 miles ESE of Katherine, 14.31S 132.22E, at light, 2♀♀, 30.xi.1967, 2♂♂, 6.xii.1967, 1♂ (terminalia slide 192), 7.xii.1967, 1♀, 8.xii.1967, 1♀, 9.xii.1967, 1♀, 13.xii.1967, 2♂♂, 14.xii.1967, 1♀, 16.xii.1967, 1♀, 18.xii.1967, 1♀,1 (abdomen missing); 19.xii.1967, 1♂ (terminalia slide 191), 20.xii.1967, W.J.M. Vestjens; Goose Lagoon, 11km SW by S of Borroloola, 1♀, 18.vi.1976, Key, Balderson, et al. [Key's field trip notes; trip 191, Stop 3614.8]; Daly River Miss., at light, 3♀♀, 8.x.1974, J.F. Hutchinson. WESTERN AUSTRALIA. ANIC: 10km NW by N of mining Camp, Mitchell Plateau, Kimberley Distr., 1♂, 11.v.1983, D.C.F. Rentz & J. Balderson, Stop 15.

DESCRIPTION

Male. Head hidden under pronotum. Interocular space less than distance between ocellar spots and antennal sockets. Pronotum suboval (Fig. 35A). Tegmina and wings extending well beyond end of abdomen. Tegmina with median and cubitus veins with longitudinal branches (Fig. 35A). Hind wing folded along plical area, intercalated triangle large, rolled up, tubuliform when at rest (Fig. 35A); median and cubitus veins curved, the latter with 1 complete and 0 incomplete branches (Fig. 35B). Front femur Type B_2 (with 3 large proximal spines); pulvilli appear to be present on the fourth tarsomeres only, tarsal claws simple, symmetrical, arolia well developed. Seventh abdominal tergum with distinct medial depression containing some groups of short setae (Fig. 35C). Supraanal plate with hind margin convexly rounded, entire, not reaching hind margin of subgenital plate. Subgenital plate almost symmetrical with 2 minute, similar, widely spaced styles on rounded apex (Fig. 35D). Genitalia as in Figs 35D-F; genital hook on the left side, its apical portion expanded, with preapical incision, basal arm uniformly slender, median phallomere relatively stout, distal region tapering, apex acute or subacute, right phallomere reduced to small cleft sclerite bearing small group of setae.

Colouration. Head brown. Pronotum with pair of dark brown longitudinal bands, these continuing length of tegmina (Fig. 35A). Abdominal terga and sterna pale with lateral infuscation. Legs and cerci pale. Intensity of brown on head, pronotum, and tegmina varies and some specimens approach blackish brown.

Female. Supraanal plate trigonal, apex of hind margin medially indented, reaching upturned margin of subgenital plate.

Measurements (♀ in parentheses). Length, 5.2-6.0 (4.9-6.2); pronotum length x width, 1.5 x 1.9-2.0 (1.5-1.7 x 1.9-2.3); tegmen length, 4.9-5.6 (4.6-6.0).

Pseudectoneura Princis

Pseudectoneura Princis, 1974, p.517.

TYPE SPECIES

Pseudectoneura kaltenbachi Princis, by monotypy.

DIAGNOSIS (based on ♂)

Tegmina and wings fully developed, former with unbranched discoidal vein, median and cubitus veins and their branches longitudinal. Hind wing with discoidal vein branched distally, median and cubitus vein practically straight, former simple, latter with complete and no incomplete branches, apical triangle developed, rolled spirally when at rest (Fig. 36D). Front femur Type B_3; pulvilli present on 4 proximal tarsomeres of all tarsi, tarsal claws symmetrical with subobsolete serrations on ventral margins, arolia present; ventral margins of mid and hind femurs with large spines. Seventh abdominal tergum strongly modified with deep fossa and large dense tuft of setae (Fig. 36E). Subgenital plate strongly asymmetrical with single style on left side, right style absent (Fig. 36G). Hooklike genital phallomere on left side (Fig. 36G).

REMARKS

Pseudectoneura differs from *Parectoneura* as follows: hind wing with discoidal vein branched, median and cubitus veins practically straight, gland on T7 much more complex, subgenital plate strongly asymmetrical, and right style absent.

Pseudectoneura kaltenbachi Princis
(Figs 36A-G)

Pseudectoneura kaltenbachi Princis, 1974, p.518, fig. 4 (♂).

MATERIAL EXAMINED

HOLOTYPE: ♂, New Caledonia, Riv. Tiari, Niaouli-Wald, 17.xi.1965, Österreichische Neukaledonien-Expedition, 1965 (PNK 80/2); in NMWA.

PARATYPE: NEW CALEDONIA. NMWA, same data as holotype, 1♂ (terminalia slide 55).

DESCRIPTION

Male. Interocular space distinctly less than distance between ocellar spots (Fig. 36A); palpal segments 3 and 5 each longer than fourth. Pronotum subelliptical, widest point behind the middle (Fig. 36B). Tegmina and wings fully developed, extending beyond end of abdomen. Tegmina with median and cubitus veins and their branches longitudinal. Hind wing with costal veins weakly thickened, discoidal vein branched beyond middle; median and cubitus veins practically straight, former simple, latter with 1 complete and 0 incomplete branches, apical triangle developed, spirally rolled when at rest (Fig. 36D). Front femur Type B_3 (with 4 large proximal spines, followed by a short row of only 5 piliform spinules); large spines on mid and hind femurs; pulvilli present on 4 proximal tarsomeres of all tarsi (Princis incorrectly claimed that the hind tarsus has a pulvillus only on the fourth segment); tarsal claws symmetrical their ventral margins with subobsolete serrations, arolia present. First abdominal tergum un-

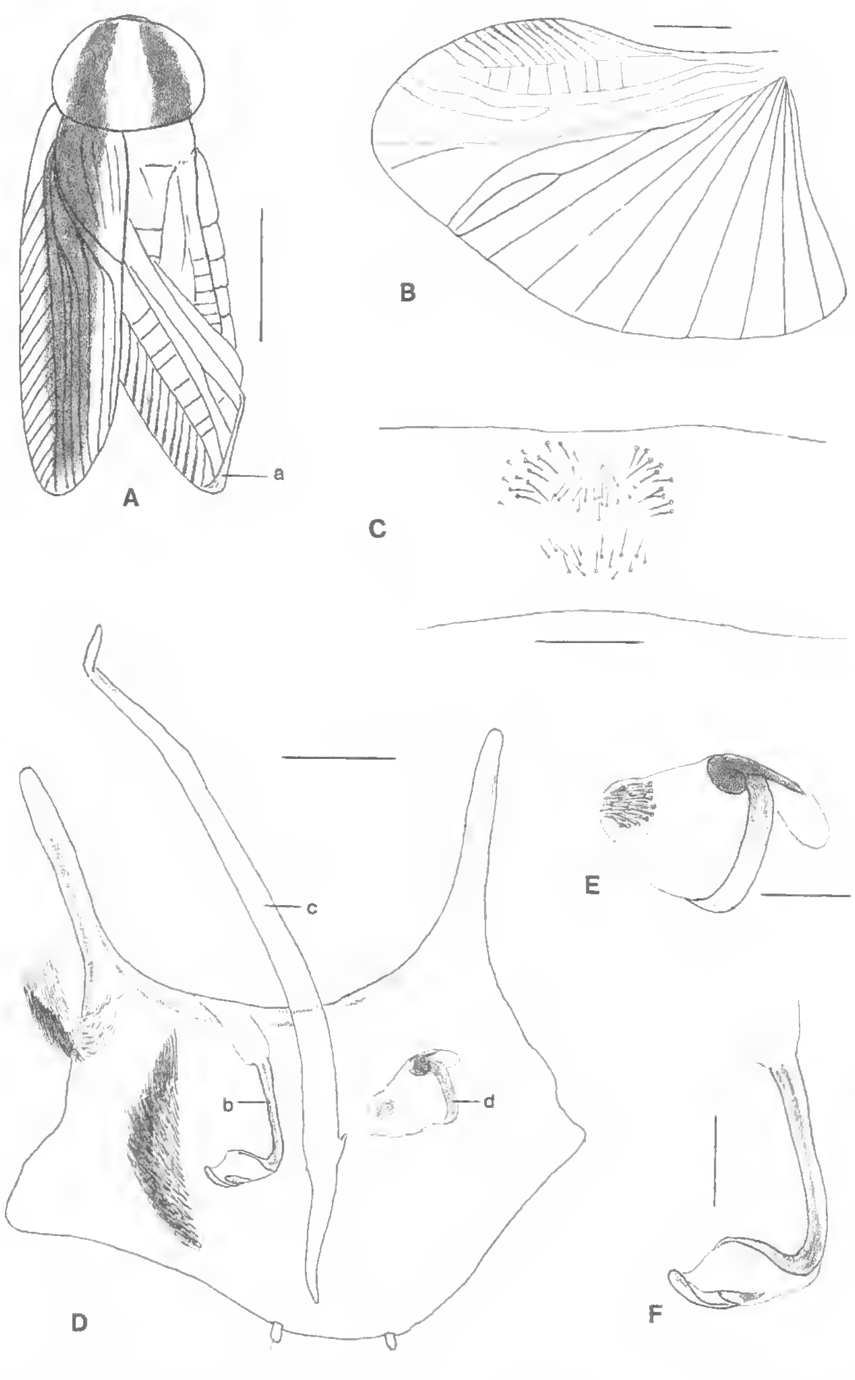

FIG. 35. *Parectoneura bivittata* n.sp., paratypes from Northern Territory. A, ♀ from Daly River Miss., habitus (right tegmen removed to show the underlying folded hind wing; a = rolled up apical triangle of left wing); B, ♀ from Goose Lagoon, hind wing; C-F, ♂ from Tindal, 8 miles ESE of Katherine: C, Tergal gland area on T7; D, Subgenital plate and genitalia (dorsal; b = left phallomere; c = median phallomere; d = right phallomere); E, right genital phallomere; F, left hooklike phallomere. Scales (mm): A, 2.0; B, 1.0; C,D, 0.25; E,F, 0.1.

specialised. Seventh abdominal tergum with a large gland anteromedially consisting of a deep fossa and a dense group of setae (Fig. 36E). Supraanal plate with hind margin concavely excavated, not reaching hind margin of subgenital plate; right and left paraprocts large dissimilar plates (Figs 36F). Subgenital plate convex, strongly asymmetrical, the left side excavated in which is located a cylindrical left style, right style absent; right half of subgenital plate produced as large lobe whose rounded hind margin is divided and forms a spinelike process which Princis claimed is the right style. However this structure is not articulated and apparently is a modification of the hind margin but not the right style, which is absent (Figs 36C,E,G). Genitalia as in Fig. 36G; hooklike phallomere on left side; apex of median phallomere with a brushlike group of dark setae, right phallomere reduced to cleftlike remnant.

Colouration. Head with vertex dark reddish brown, occiput lighter, interocellar area whitish, face yellowish brown with whitish areas laterally, labrum brownish (Fig. 36A). Pronotum with disk yellowish brown and brown parentheses-like markings on anterior half, lateral borders hyaline (Fig. 36B). Tegmina pale, hyaline, humeral vein may be darkened. Hind wing with yellowish tinge along anterior border and behind apical triangle, grayish on posterior region of apical triangle and along edges of posterior field (Fig. 36D). Proximal abdominal terga light yellowish brown with some infuscation, distal segments dark brown, glandular region of T7 pale yellowish, glandular setae dark, supraanal plate pale, laterally dark. Abdominal sterna light brown, laterally dark brown.

Female. Unknown.

Measurements: Length, 12.3-12.5; pronotum length x width, 2.6 x 3.7-3.8; tegmen length, 11.7-11.8.

Pseudectobia Saussure

Pseudectobia Saussure, 1869, p.234; Princis, 1951, p.65.

TYPE SPECIES

Pseudectobia luneli (Saussure) = *Blatta luneli* Saussure, by selection, Kirby, 1904, p.65.

DIAGNOSIS (based on ♂ and modified from Princis, 1951).

Tegmina and wings fully developed. Tegmen with discoidal sectors longitudinal. Hind wing with cubitus vein straight and with complete and no incomplete branches, apical triangle poorly developed and not rolled spirally. Front femur Type B_2; ventral margins of mid and hind femurs sparsely armed. Seventh abdominal tergum with deep fossa that occupies most of the segment. Subgenital plate symmetrical with pair of similar styles. Hooklike genital phallomere on right side (Fig. 37E).

REMARKS

This genus differs strongly from *Parectoneura* and *Pseudectoneura* in hind wing structure and in having the male hooklike genital phallomere on the right rather than the left side.

Pseudectobia luneli (Saussure)
(Figs 37A-E)

Blatta luneli Saussure, 1868, p.355 (♂); Walker, 1871, p.20.

Ectobia (*Pseudectobia*) *luneli* (Saussure), 1869, p.235.

Ectobia luneli (Saussure): Walker, 1871, p.15.

Phyllodromia luneli (Saussure): Shelford, 1908, p.12.

Pseudectobia luneli (Saussure): Kirby, 1904, p.65; Princis, 1951, p.65., pl.6, fig. 65 (♂); 1969, p.996.

MATERIAL EXAMINED

HOLOTYPE: ♂ (terminalia slide no. 1), Neelgheries, Indes [= Nilgiri, India], coll. Guérin; in MNHG. [The specimen is in very poor condition; it is greasy, the tegmina and wings are badly damaged as are most of the legs - all tarsal claws are missing; Shelford (1911:156) examined the type and described it as 'very shattered'. It obviously hasn't improved with age].

DESCRIPTION

Male. Eyes very close together, almost contiguous (Fig. 37B). Pronotum suboval (Fig. 37A). According to Princis (1951, p.65) the tegmina and wings are fully developed reaching beyond end of abdomen. Median vein of tegmen separated from discoidal vein and supplied with 1 branch, discoidal sectors longitudinal; costal veins of hind wing very weakly thickened distad. The remains of the wing shows that the cubitus is straight and has at least 3 complete and 0 incomplete branches; the apical region is missing but Shelford (1911, p.156) stated that there is 'a small and ill-defined apical triangle'. According to Saussure (1869), the reflexed field of the hind wing is crumpled in repose (therefore not tubuliform as in *Pseudectoneura*). Front femur

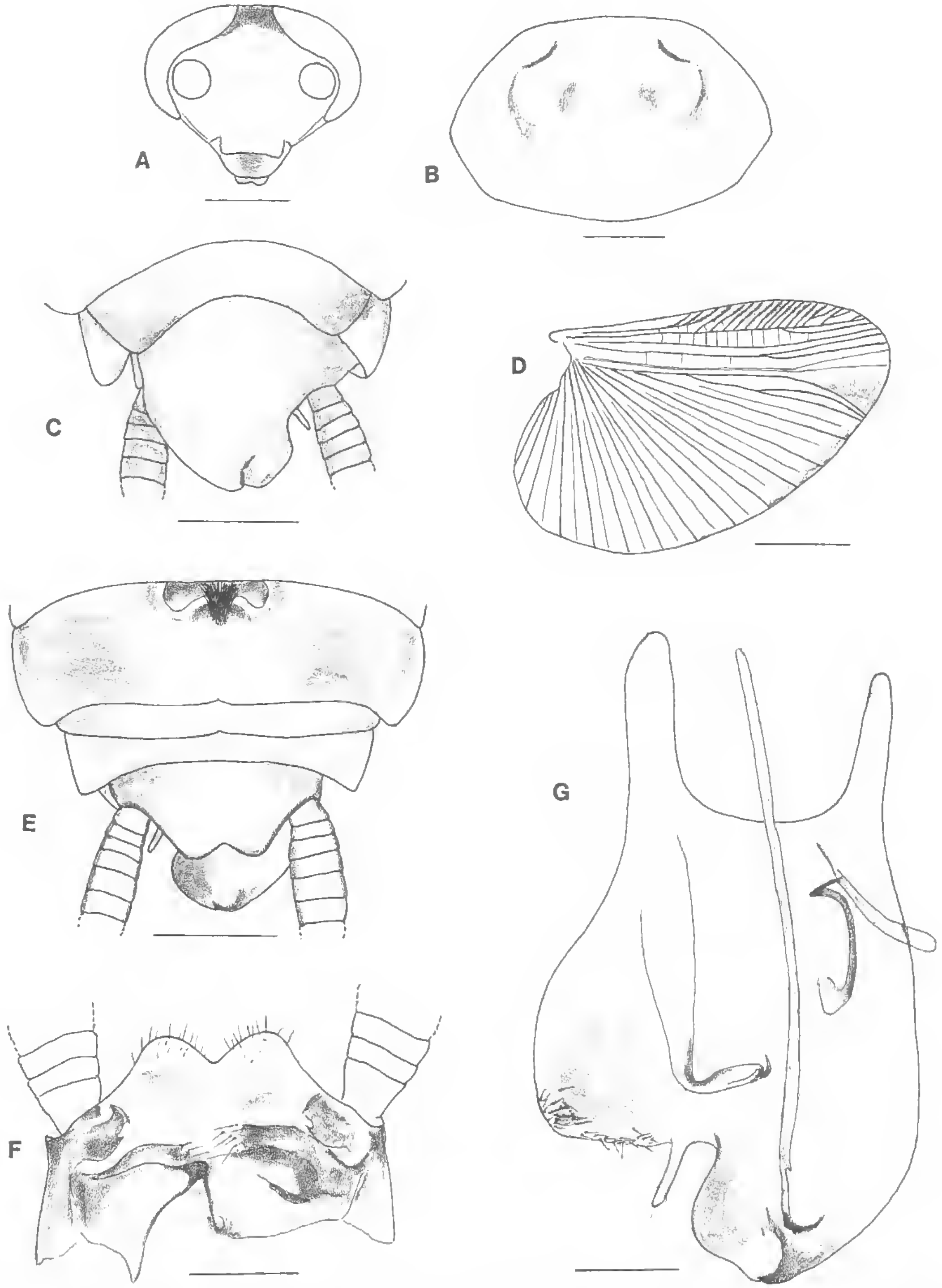

FIG. 36. *Pseudectoneura kaltenbachi* Princis, ♂♂. A,B,D, holotype; C,E-G, paratype: A, Head; B, Pronotum; C, Subgenital plate (ventral); D, Hind wing; E, Abdominal terga 7 to supraanal and subgenital plates (dorsal); F, Supraanal plate and paraprocts (ventral); G, Subgenital plate and genitalia (dorsal). Scales (mm): A-C, 1.0; D, 3.0; E, 1.0; F,G, 0.5.

Type B_2 (4 large proximal spines two of which are broken off, as is one of the terminal spines); tarsi damaged, none with claws. Seventh abdominal tergum (dried pinned specimen) with huge deep elliptical pit that occupies practically entire segment, posterior wall with minute setae (Fig. 37D); in KOH cleared specimen pit is seen to be pair of large depressions separated by longitudinal wall. Supraanal plate transverse, hind margin practically truncate, not reaching hind margin of subgenital plate (Fig. 37D); right and left paraprocts similar plates. Subgenital plate symmetrical, lateral margins of distal region indented, bearing pair of similar cylindrical styles, interstylar margin produced and in pinned specimen appears to be a single projection (Fig. 37C), but when cleared in KOH consists of 2 small lobes (Fig. 37E). Genitalia as in Fig. 37E: hook on right side, apex truncate, without subapical incision or spine; median phallomere rod-like, tapering, apically acute; a pair of curved sclerites between median and right phallomeres.

Colouration. The colour is difficult to determine because the specimen is greasy. Head with occiput black, face yellowish with black markings (Fig. 37B). Pronotum with broad, triangular black macula, lateral borders pale (Fig. 37A). Abdomen mostly light brown.

Female. Unknown

Measurements. Length, 7.6; pronotum length x width, 2.0 x 2.9; tegmen length, 7.

REMARKS

Princis (1969, p.996) listed 2 species of *Pseudectobia*, namely the type species *luneli*, and *insularis* (Saussure) which I find belongs in *Chorisoblatta*, and describe below.

Chorisoblatta insularis (Saussure) n.comb. (Figs 38A-G)

Ectobia (*Pseudectobia*) *insularis* Saussure, 1869, p.236 (♂).

Ectobia insularis Saussure: Walker, 1871, p.15.

Theganopteryx insularis (Saussure and Zehntner), 1895, p.14.

Lupparia insularis (Saussure): Shelford, 1908, p.16.

Pseudectobia insularis (Saussure): Kirby, 1904, p.65, Orian, 1957, p.517; Princis, 1969, p.996.

MATERIAL EXAMINED

HOLOTYPE: ♂ (terminalia slide no. 2), Ile de France [= Mauritius], Afrique, M H. de Saussure; in MNHG.

DESCRIPTION

Male. Interocular space less than distance between antennal sockets (Fig. 38C). Pronotum subelliptical (Fig. 38B). Tegmina and wings fully developed extending beyond end of abdomen. Hind wings with costal veins weakly thickened distad, discoidal and median veins unbranched, cubitus vein straight with 3 branches that reach only to the vein demarcating the large apical triangle (Fig. 38A). Front femur Type B_2 (with 3 large proximal spines); pulvilli present on 4 proximal tarsomeres, tarsal claws symmetrical, ventral margins bearing a few large teeth, arolia well developed (Fig. 38F). Abdominal terga unspecialised. Supraanal plate subtrapezoidal, corners rounded, hind margin not reaching hind margin of subgenital plate (Fig. 38D). Subgenital plate extending well beyond supraanal plate, styles similar, widely separated, each located in posterolateral corners, interstylar margin convex, deflexed (Figs 38D,E); in dorsal view interstylar margin appears truncate because deflexed portion is not visible from above (Fig. 38D). Genitalia as in Fig: 38G: genital hook on right side, apex with minute spine; to right of hook an additional divided sclerite, its most posterior portion bearing dark setae; median sclerite long, slender, apically acute.

Colouration. Head with vertex and occiput brown; two narrow, black transverse bands, one between eyes, other between upper part of antennal sockets (Fig. 38C), remainder of face largely hyaline. Pronotum yellowish, disk with brown dots and lines, outer border regions partly hyaline (Fig. 38B). Tegmina with some yellowish and mostly reddish rectangular and dot-like spots between veins. Hind wing infuscated, anterior margin at distal ends of costal veins, white; anterior field and region posterior to apical triangle darker than rest of posterior field and apical triangle (Fig. 38A); one wing that has been mounted on a card was completely bleached and was not infuscated; the wing that was still attached to the specimen (and which I mounted on a card) had the infuscation described by Saussure. Legs light brown, femur with dark brown stripe on dorsal margin, foreleg tarsomeres with narrow brown apical rings. Abdominal terga brown, darker infuscation laterally and on terminal segments. Abdominal sterna brown with broad, somewhat darker mediolongitudinal, stripe.

Female. Unknown.

Measurements. Length, 9.8; pronotum length x width, 2.6 x 3.8; tegmen length, 11.4.

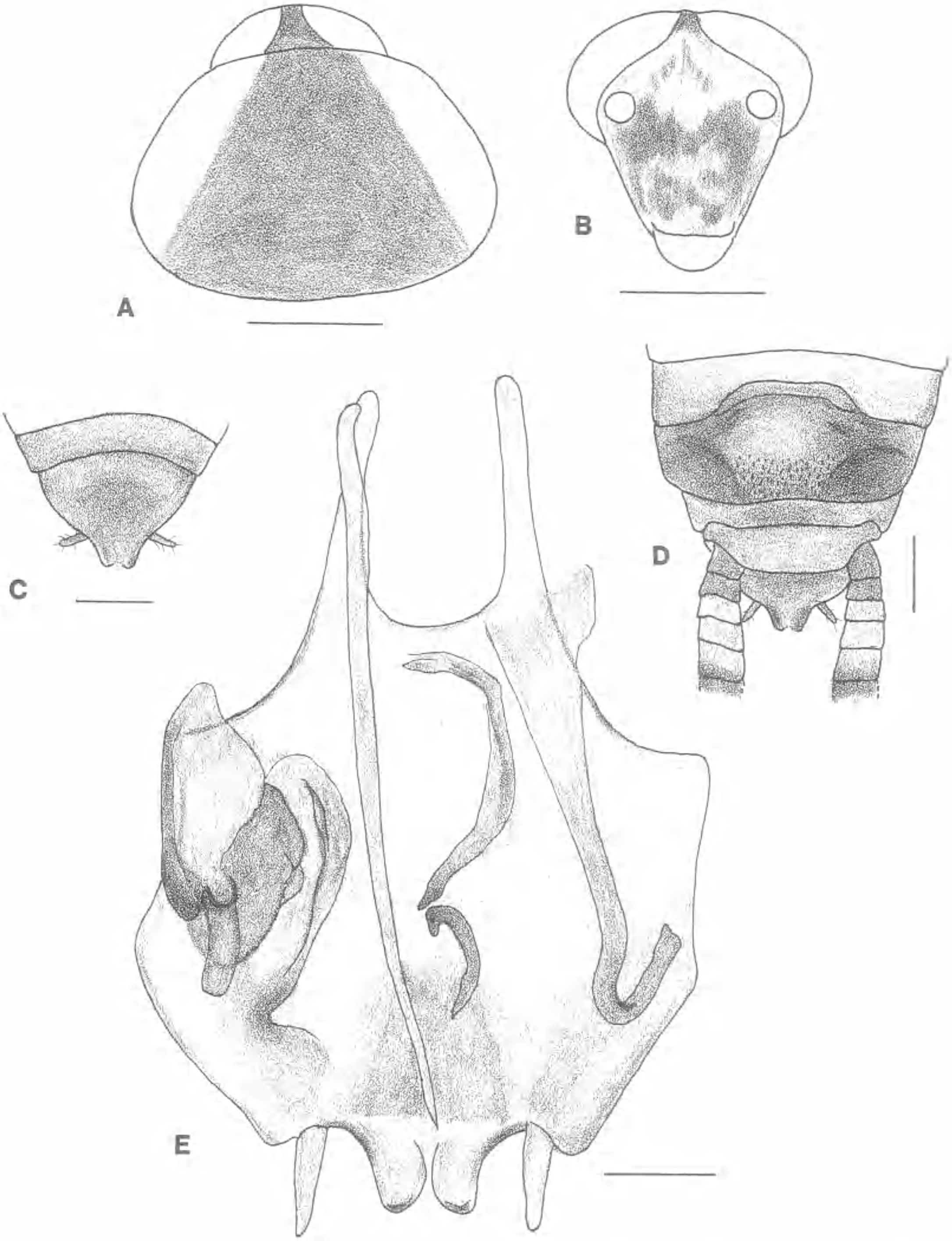

FIG. 37. *Pseudectobia luneli* (Saussure), ♂ holotype: A, Pronotum and head; B, Head; C, Subgenital plate (ventral); D, terminal abdominal segments (dorsal); E, Subgenital plate and genitalia (dorsal). Scales (mm): A,B, 1.0; C,D, 0.5; E, 0.25.

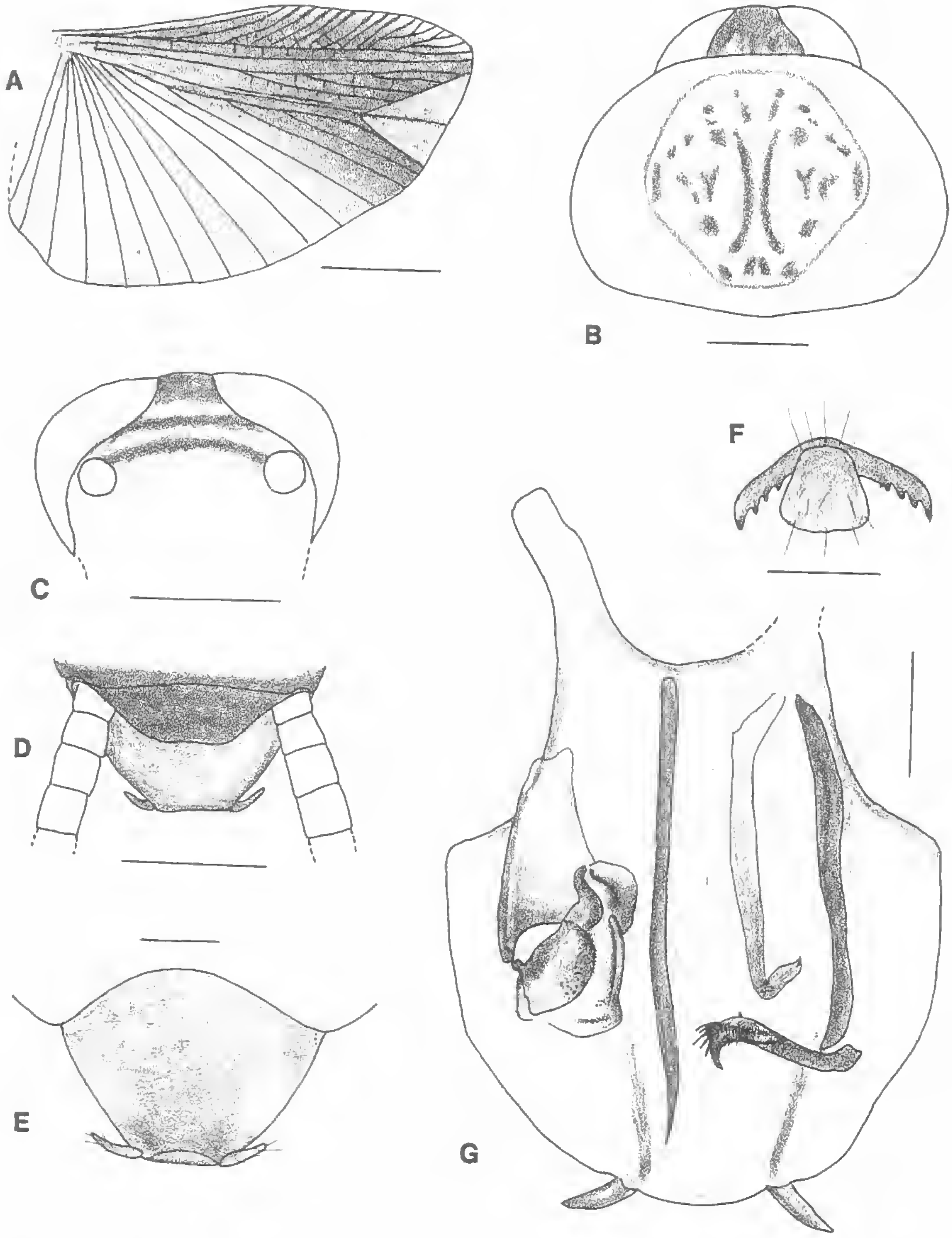

FIG. 38. *Chorisoblatta insularis* (Saussure), ♂ holotype of *Ectobia* (*Pseudectobia*) *insularis* Saussure: A, Hind wing; B, Pronotum; C, Upper portion of head; D, Terminal abdominal segments (dorsal); E, Subgenital plate (ventral); F, Tarsal claws and arolium of foreleg; G, Subgenital plate and genitalia (dorsal). Scales (mm): A, 3.0; B-D, 1.0; E, 0.5; F, 0.25; G, 0.5.

REMARKS

Princis (1969, pp.925-927) listed 11 species of *Chorisoblatta* of which 7 (one with a query) are from Africa, 2 from Madagascar, and 2 are from Mauritius. Of the Mauritian species one is *C. liturifera* (Stål), the type species of the genus, and the other is *Chorisoblatta chopardi* Princis (Princis, 1969, p.926). *Chorisoblatta insularis* is the third species of the genus known from Mauritius.

SUBFAMILY PLACEMENT OF *PARECTONEURA*, *PSEUDECTONEURA*, *PSEUDECTOBIA* AND *CHORISOBLATTA*

According to McKittrick (1964), the Blattellinae and Ectobiinae (based on 2 species of *Ectobius*) males have the genital hook on the left side and their females rotate the ootheca 90° prior to depositing them. In McKittrick's Plectopterinae (= Pseudophyllodromiinae of Vickery and Kevan, 1983), the male's genital hook is on the right side and their females do not rotate the ootheca prior to deposition. However, Bohn (1987) found that the males of some Ectobiinae have the genital hook on the right side (rather than the left), yet their females rotate the ootheca. Bohn concluded that the position of the male's genital hook cannot always be used to place blattellids in their respective subfamilies and suggested that whether or not the female rotates her ootheca should be the criterion for placing a species in one or the other of these two subfamilies. I have recently found that the males of *Margattea nimbata* Shelford have the genital hook on the right side but the female rotates its ootheca and I place this species in the Blattellinae (Roth 1989). Unfortunately, whether or not the ootheca is rotated is not known for most genera and species, including the genera under discussion in this paper. However, until oviposition behaviour is determined one can place a species in the Blattellinae or Pseudophyllodromiinae provisionally, if the position of the male's genital hook is known; subfamily placement can be confirmed when the female's oviposition behaviour is determined.

With this in mind I am placing *Parectoneura* and *Pseudectoneura* in the Blattellinae and *Pseudectobia* and *Chorisoblatta* in the Pseudophyllodromiinae. Shelford (1911, p.156) believed that *Pseudectobia luneli* '... is more suitably placed in the Ectobiinae', but Princis placed it in the Blattellidae rather than the Ectobiidae. I agree with Princis because the male subgenital plate and styles, and genitalia of *luneli* are more typical of the Blattellidae than they are of the Ectobiidae (nae).

ACKNOWLEDGEMENTS

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